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CANADIAN MILITIA

TRAINING PAMPHLET No. 1

A General Instructional Background for the Young Soldier

1940

OTTAWA
J. O. PATENAUDE, I.S.O.
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1940

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A General Instructional Background for the Young Soldier 1940

IN SEVEN PARTS

PART I—INFANTRY DRILL, MARCHING AND PHYSICAL TRAINING.
" II—WEAPON TRAINING.
" III—APPLICATION OF FIRE.
" IV—PROTECTION AGAINST GAS.
" V—ORGANIZATION AND TACTICAL TRAINING.
" VI—FIELD ENGINEERING.
" VII—MILITARY LAW AND INTERIOR ECONOMY.

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1940

PREFATORY NOTE

The object of this pamphlet is to combine in one handy volume a summary of those subjects which will be taught at N.P.A.M. Training Centres during the first period of training.

It is hoped that it will be both a means of assisting the student during that training, and an indication, to those desirous of continuing the study of military subjects, of the lines along which enquiry may be made and reading directed.

In the ensuing pages, the basic references have been shown wherever advisable, but not necessarily by chapter and section; as space requirements have made necessary a considerable degree of curtailment and abbreviation.

DEPARTMENT OF NATIONAL DEFENCE,
Ottawa, Canada, September, 1940.

8241—1½

CONTENTS

	Page
Prefatory Note	3
List of Illustrations	10
List of Manuals, etc.	12

Part I—Infantry Drill, Marching and Physical Training

Chapter I—Modifications Consequent on Adoption of Movement in "Threes"	
Section 1—Squad Drill	13
" 2—Arms Drill	14
" 3—Examples of modified Battalion, Company and Platoon movements in "threes"	15
Chapter II—Individual Movements of Elementary Drill—	
Section 1—Attention	22
" 2—Standing at Ease	22
" 3—Standing Easy	22
" 4—Turning by numbers	23
" 5—Length of pace and time in marching	23
" 6—Position in marching	24
" 7—Marching in quick and slow time	24
" 8—Changing step	25
" 9—Marching in double time	26
" 10—The side step	26
" 11—Turning when on the march	27
Chapter III—Individual Movements of Elementary Drill with Arms—	
Section 1—Falling in with rifles at the order	28
" 2—To stand at ease and stand easy from the order	28
" 3—Attention from stand at ease	28
" 4—The slope from the order	28
" 5—The order from the slope	29
" 6—The present from the slope	29
" 7—The slope from the present	31
" 8—Inspection of arms	31
" 9—Instructions for inspecting arms	32
" 10—To examine arms	32
" 11—The trail from the order	32
" 12—The order from the trail	33
" 13—The trail from the slope	33
" 14—The slope from the trail	33
" 15—To change arms when at the slope	33
" 16—To change arms when at the trail	33
" 17—The short trail	34
" 18—To sling arms	34
" 19—Drill with the Ross Rifle	34
Chapter IV—How and When to Salute—	
Section 1—How to Salute: without arms	35
" 2—When to Salute: without arms	35
" 3—How to salute with the rifle (at the slope)	37
" 4—When to salute, when carrying a rifle	39

CONTENTS—*Continued*

	Page
CHAPTER V—MARCHES AND MARCH DISCIPLINE—	
Section 1—Points which require attention on the march	40
" 2—Importance of march discipline	41
" 3—Halts	41
" 4—Night marches	43
CHAPTER VI—PHYSICAL TRAINING—	
Section 1—Object	45
" 2—Principles	45
" 3—Application	45
Part II—Weapon Training	
CHAPTER VII—THE RIFLE—	
Section 1—General	47
" 2—Mechanism and Cleaning	47
THE LEE-ENFIELD RIFLE—	
Section 3—Mechanism	48
" 4—Removing and replacing bolt	48
" 5—Removing and replacing magazine	48
" 6—Half-cock and how to re-cock	48
THE ROSS RIFLE—	
Section 7—Special features	49
" 8—Removing and replacing bolt action	49
" 9—Caution on Ross bolt: not to be stripped	50
" 10—General principles of Ross Rifle Design	50
ALL RIFLES—	
Section 11—Trigger pressing	54
" 12—How to clean your rifle	54
" 13—To load and unload the rifle	56
" 14—Additional note on "Ross" loading	57
" 15—Accuracy of Aim (Sight Setting and Rules of Aiming)	57
" 16—Advanced Aiming Instruction	60
" 17—Note on points of aim	60
" 18—Firing Instruction	60
" 19—Fire Discipline Training	67
" 20—Tests of Elementary Training in the Rifle	67
CHAPTER VIII—THE THEORY OF SMALL ARMS FIRE—	
Section 1—Importance	69
" 2—Elementary Theory (Rifle)	69
" 3—Definitions	71
" 4—Elevation	74
" 5—Effect of Wind	74
" 6—Trajectory Table	75
" 7—Range Table	75
CHAPTER IX—ANNUAL RANGE COURSE (RIFLE)—	
Section 1—Course to be fired	76
" 2—Range Discipline	76
" 3—Special Conditions	78
" 4—Safety	78
CHAPTER X—ANTI-AIRCRAFT—	
LESSON I—PRICIS OF PRELIMINARY LECTURE—	
Section 1—Principles of Small Arms A.A. Defence	80
" 2—Protection	80
" 3—Considerations in training	81

CONTENTS—*Continued*

	Page
Chapter X—Anti-Aircraft—*Con.*	
Lesson 2—Direct Attacker (Rifle)—	
Section 4—Instructor's Notes	82
" 5—Apparatus and Accessories	84
Lesson 4—The Lead (Rifle)—	
Section 6—Instructor's Notes	86
Lesson 5—Crossing Aeroplane (Rifle)—	
Section 7—Instructor's Notes	88
Chapter XI—The Bayonet—	
Section 1—General	89
" 2—Lesson on the Training Stick	90
" 3—The Butt Stroke	93
" 4—Firing from the Hip	94
Part III—Application of Fire	
Chapter XII—Visual Training—	
Section 1—Object	96
" 2—Methods of Training	96
" 3—The Military Vocabulary	96
Chapter XIII—Fire—	
Section 1—Fire Effect	98
" 2—Selection of Fire Positions	98
" 3—Indication of Target	99
" 4—Finding the Range	101
" 5—Fire Control Orders	101
" 6—Range Cards	102
Part IV—Protection Against Gas	
Chapter XIV—Protection Against Gas in the Field—	
Standard of Training Required	106
War Gases—	
Section 1—Definitions	106
" 2—Classification of Gases	107
Choking Gases: Section 3—Phosgene	107
" " 4—Other Choking Gases	108
" " 5—First Aid for Choking Gases	108
Nose Gases: Section 6—D.M.	109
" " 7—Other Nose Gases	109
" " 8—First Aid for Nose Gases	109
Tear Gases: Section 9—B.B.C.	110
" " 10—C.A.P.	110
" " 11—First Aid for Tear Gases	110
Blister Gases: Section 12—Mustard Gas	110
" " 13—Lewisite	112
" " 14—First Aid for Blister Gases	113
Gas Weapons—	
Section 15—The Employment of Gas by an Enemy	114
Ground Gas Weapons: Section 16—Cylinders	114
" " " 17—Projectors	115
" " " 18—Mortars	115
" " " 19—Generators	116
" " " 20—Artillery Gas Shell	116

CONTENTS—*Continued*

	Page
CHAPTER XIV—*Con.*	
GAS WEAPONS—*Con.*	
Weapons Employed by Aircraft: Section 21—Aircraft Bombs	116
" " " 22—Aircraft Spray	117
Individual Protection: Section 23—Personal	118
" " " 24—Protection Against Choking Gases	119
" " " 25—Individual Protection Against Aircraft Spray	119
" " " 26—Personal Decontamination	120
" " " 27—Protection Against Blister Gas Vapour	122
Personal Equipment: Section 28—Eye-shields, anti-gas	123
" " " 29—Capes, anti-gas	123
" " " 30—Ointment, anti-gas, No. 1	124
" " " 31—Ointment, anti-gas, No. 2	124
" " " 32—Cotton Waste	124
" " " 33—Detectors, gas, individual	124
" " " 34—Detectors, gas, ground	124
APPENDIX "A"—List of War Gases	126
APPENDIX "B"—Instructions for Putting on the Cape, Anti-gas, in the "Rolled" Position	128
APPENDIX "C"—Tests of Elementary Training, Gas (General, Oral, Inspection and Standard)	129
CHAPTER XV—RESPIRATORS—	
Section 1—Description	133
" 2—Fitting	136
CHAPTER XVI—RESPIRATOR LESSONS FOR RECRUITS, AND RESPIRATOR DRILL—	
RESPIRATOR LESSONS FOR RECRUITS—	
Lesson 1—Recruit's Initial Lesson	138
Lesson 2—Care and Cleaning	138
RESPIRATOR DRILL—	
Lesson I—The Slung Position	139
Lesson II—The Gas Alert Position	139
Lesson III—The Alternative Gas Alert Position	140
Lesson IV—The Gas Position from the Gas Alert or Alternative Gas Alert	140
Lesson V—The Gas Position from the Slung	141
Lesson VI—Test for Gas	141
Lesson VII—Removal and Return of Facepiece to Haversack	142

Part V—Organization and Tactical Training

CHAPTER XVII—INFANTRY ORGANIZATION—	
Section 1—The Battalion	143
" 2—The Signal Platoon	144
" 3—The Anti-Aircraft Platoon	144
" 4—The Mortar Platoon	144
" 5—The Carrier Platoon	144
" 6—The Pioneer Platoon	145
" 7—The Administrative Platoon	146
" 8—The Rifle Company	146

CONTENTS—*Continued*

		Page
Chapter XVIII—Tactical Training—		
Section	1—The Eight Principles of War	149
"	2—Tactics	149
"	3—The Fighting Qualities of the Troops	150
"	4—Infantry	150
"	5—A List of Military Definitions Pertaining to Infantry	151
Chapter XIX—Infantry and Supporting Weapons—		
Infantry Weapons and Their Characteristics—		
Section	1—Light Machine Gun	154
"	2—Rifle and Bayonet	159
"	3—Anti-tank Rifle	159
"	4—2-inch Mortar	159
"	5—H.E. Grenade	159
"	6—Battalion Weapons	160
Supporting Arms and Weapons—		
Section	7—General	165
"	8—Cavalry	166
"	9—Artillery	166
"	10—Machine Guns	167
"	11—Tanks	167
"	12—Anti-tank Guns	168
"	13—Anti-tank Mines	168
"	14—Aircraft	168
"	15—How to help friendly supporting arms	169
Chapter XX—Elementary Tactics—		
Ground and Formations—		
Section	1—Field Signals	170
"	2—Fieldcraft	172
"	3—Cover from View	173
"	4—Keeping Direction	174
"	5—Section Formations	175
Scouts and Patrols—		
Section	6—Scouts	177
"	7—Patrols	178
"	8—Reconnoitring Patrols	178
"	9—Fighting Patrols	179
"	10—Standing Patrols	179
Sentries—		
Section	11	180
Part VI—Field Engineering		
Chapter XXI—Protective Works for Section—		
Section	1—The Section Commander's Responsibilities	181
"	2—Improvement of Natural Cover	181
"	3—Weapon Pits	182
"	4—Crawl Trench	184
Chapter XXII—Concealment and Camouflage, Wiring and Road Blocks—		
Section	1—Concealment and Camouflage	186
"	2—Wiring	189
"	3—Road Blocks	191

8341—2

Part VII—Military Law and Interior Economy

		Page
Chapter XXIII—Military Law and Discipline—		
Section	1—Military Law; Its Nature and Purpose	193
"	2—Discipline	194
"	3—Arrest	194
"	4—Powers of a Commanding Officer	195
"	5—Powers of a Company Commander	195
"	6—Powers of Detachment Commander	196
"	7—Redress of Grievances	196
"	8—Attempts to Seduce from Duty	196
"	9—Wrong Channel of Personal Communication	197
"	10—Illegal Communication of Military Information	197
"	11—The Rights of a Soldier when in Arrest Charged with an Offence under the Army Act	197
Chapter XXIV—Interior Economy—		
Hygiene and Sanitation—		
Section	1—Introduction	200
"	2—The Objective of Sanitation	201
"	3—Personal Hygiene	201
Games and Sports—		
Section	4—Policy	203
"	5—Physical Efficiency Test	203
N.P.A.M. Pay from Boy to W.O. I—		
Section	6—Daily Rates	205
"	7—Conditions regarding Pay of W.O.'s and N.C.O.'s	206

LIST OF ILLUSTRATIONS

	Page
Key to Drill Plates	15
Platoon in Line in Three Ranks	16
Platoon in Column of Route (Threes)	16
Company in Line by Platoons (Training)	17
Company in Line (Ceremonial)	17
Company in Column of Route	18
Company in Close Column (Ceremonial)	18
Battalion in Column of Route	19
Battalion in Line	20
Battalion in Close Column	21
The Order, the Slope, the Present and the Trail	30
Saluting to the Front	36
The Salute with the Rifle at the Slope	38
Good and Bad March Discipline	42
Action of Lee-Enfield Bolt and Cocking Piece Plate I	following page 48
Action when Bolt is pushed forward Plate II	following page 48
Action when Trigger is pressed Plate III	following page 48
Action when Bolt is turned up to unload Plate IV	following page 48
Ross Mark III Rifle—Mechanism (Plate A)	51
Ross Bolt Sleeve Parts, etc. (Plate B)	52
Ross Bolt Action, Trigger Action, etc. (Plate C)	53
Carelessness and Cordwear	55

LIST OF ILLUSTRATIONS—*Concluded*

PAGE

Aiming Instruction diagrams—open sight, peep-sight, aiming off (and clock-ray reference examples for "Indication") 58
One way to miss the whole target 59
Leading Position, prone 61
Close-up of above 62
The "Standing Load" 63
Standing aim and fire 64
Firing round isolated cover 64
Sitting position—load and fire 65
Kneeling position—load and fire 66
Cross Section of Lee-Enfield Barrel, six diameters 69
Diagram to illustrate definitions of S.A. Theory 71
Diagrams to illustrate factors of Dangerous Space—
Figs. 3-4—Range and Height of Weapon 72
Figs. 5-7—Height of object, trajectory, and ground 73
Diagram to illustrate necessity for means of elevation 74
Silhouette of German Junker JU-86-K Twin-Action Bomber Monoplane 82
A.A. Firing Position—Rifleman 83
Bren L.M.G. on A.A. Mount—"Change Magazine" } 85
Model Aeroplane (A.A.) with Pole and Stand }
Lewis L.M.G. on A.A. Mount—Aiming and Firing } 87
The 12-degree four-finger span }
The Bayonet—"On Guard" 89
" Construction of the Training Stick 90
" "High Port" and "Point" 91
" Use of the Training Stick, and withdrawal from "Point" 92
" Withdrawal from ground sack 93
" The Butt Stroke 94
Finger and Hand degree method for indication 100
No range card—no fire effect 103
Examples of Range Cards—blank and filled out 104
Examples of Range Cards—fanning-out to avoid crowded rays 105
Chart to show method of rolling "Cape, Anti-Gas" 128
Photographs of "Cape, Anti-Gas" in "worn", "alert" and "rolled" positions 131
Comparative chart of drop-sizes, aircraft spray on Detectors, Gas, Individual 132
Service Respirator—
Photo of Face-piece and Haversack, Mk. V, Container, Type E, and Anti-dimming outfit 135
Sectional chart of Container (interior) 135
Lewis L.M.G.—Holding, and changing magazines 155
Bren L.M.G.—Holding (ground), and A.A. Tripod Mounting 156
Bren L.M.G. Stripped—Butt and Body group 157
Anti-Tank Rifle: top, off-side and near-side views 158
3-inch Mortar Section in action 160
Packing the 3-inch Mortar Box 161
2-inch Mortar—Complete; also Bomb, Sights and Aiming 162
H.E. Grenade, "Mills" type 163
Pistol, Revolver, ·38-inch 164
Thompson Sub-Machine Gun 165
Vickers Medium Machine Gun, ·303-inch, mounted 167
Result of failure to use available cover 173
Formations—File, Single File, Extended Line and Arrowhead 175-178
No kind of country will stop an infantryman 179
Cover from fire must include concealment of work 182-183
Section of Weapon Pit 183
Section of Crawl Trench 184
Camouflaged Vehicle, or "disruptive painting" 186
Machine Gun Spider 188
Triple Concertina Wire Fence (Vertical Section) 190
Plan of Felled Tree Road Block 191
Which kind are you? 202

8241—2½

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		Page
Chapter	I — Modifications consequent on adoption of movement in "threes"	13
"	II — Individual movements of elementary drill	22
"	III — Individual movements of elementary drill (with arms)	28
"	IV — How and when to salute	35
"	V — Marches and march discipline	40
"	VI — Physical training	45

CHAPTER ONE

MODIFICATIONS CONSEQUENT ON ADOPTION OF MOVEMENT IN "THREES"

Military Training Pamphlet No. 18,
Manual of Elementary Drill, and Infantry Training

1. Squad Drill

1. *Three ranks.*—Squad drill will be carried out in three ranks from the commencement of a recruit's training unless numbers are insufficient when two ranks will be formed.

2. *Distance and Interval.*—Distance between ranks will be 30 inches; intervals between men will be obtained by dressing with intervals.

3. *Dressing.*—Dressing will be carried out as in the Manual of Elementary Drill, 1935, Sec. 8, except that the hand will be clenched with the knuckles touching the shoulder of the man on the right (or left). When dressing with the rifle at the order, the left arm will be extended.

4. *Taking open and close order.*—On the command "Open—order—March," the front rank will take two paces forward, and the rear rank two paces back. On the command "Close—order—March," the action of the front and rear ranks is reversed.

When dressing is carried out by word of command (as in Ceremonial), the whole squad, etc., will be dressed on completion of opening order.

5. *Elementary instruction.*—Elementary instruction in squad drill will be carried out in open order; opening and closing ranks is abolished.

When saluting instruction is carried out, the squad will be turned to a flank.

6. *Guides and blank files.*—When squads, etc., are turned about, guides and blank files will take three paces forward at the halt, or mark time three paces if on the move.

During squad drill in open order, blank files and guides will not alter their positions unless ranks are changed.

7. *Files.*—The meaning of file in three ranks is the same as for two ranks, except that the blank file will be the second and not the third file from the left. If there are only two men in a file, the centre rank will be left blank.

8. *Marching in line and changing direction.*—When squads, etc., change direction, the pivot man will take three paces forward instead of two. The second and third ranks will adhere to the drill at present laid down for the rear rank.

9. *A squad, etc., changing direction by wheeling.*—Squads or Platoons in Line may change direction by wheeling instead of forming. The action of each rank will be similar to that laid down for a section of fours (Manual of Elementary Drill, 1935, Sec. 39).

10. *Forming fours.*—This movement will be learnt only by troops required for mounting public duties and taking part in the Ceremony of the King's Birthday Parade in London.

11. *Marching in slow time.*—This will be taught.

2. Arms Drill

1. *Fixing and unfixing bayonets.*—The following procedure will be adopted:—

i. **"The squad will fix bayonets"—"Fix bayonets."**

On the command "Fix," push the rifle forward with the right hand as in the position of "Stand at Ease" with the rifle; at the same time seizing the handle of the bayonet with the left hand, back of the hand to the front and thumb and fingers to the rear, withdraw the bayonet sufficiently to allow the left arm to become straight. On the command "Bayonets," draw the bayonet, turning the point upwards and keeping the elbow down; place the handle on the bayonet standard with the ring over the stud on the nose cap, pressing it home to the catch: at the same time turn the head and eyes down to the right to ensure the bayonet is properly fixed, the head and eyes remaining in this position on completion. On the command "Attention," the position of attention will be resumed.

ii. **"The squad will unfix bayonets"—"Unfix bayonets."**

On the command "Unfix," keeping the heels closed, place the rifle between and grip it with the knees, guard to the front. At the same time seize the rifle with the left hand, knuckles to the front, thumb on the bayonet bolt spring pressing the spring with the left thumb, and with the right hand seize the bayonet handle. Disengage the bayonet clear of the rifle. On the command "Bayonets," drop the point of the bayonet to the left side, ring to the rear, at the same time seizing the scabbard with the left hand, thumb underneath the frog and turning the head and eyes towards the top of the scabbard, force the bayonet home. On the command "Attention," seize the rifle with the right hand at the band, raise the head and eyes, and resume the position of attention.

NOTE.—Cautionary words of command will not be used.

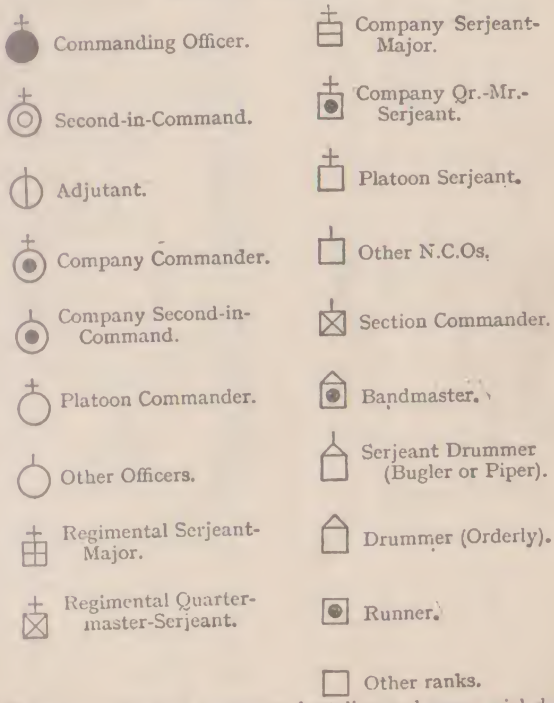
2. *Piling and unpiling arms.*—The procedure will be the same as that laid down in Manual of Elementary Drill, 1935, Sec. 67, except for the following:—

i. *Piling arms.*—The second and third ranks will stand fast (except the third rank when it moves forward to place its rifles against the piles already in position). On the command "Stand clear" all ranks will take a pace to the rear and turn to the right flank of the squad. On again falling in the men will place themselves as they stood before falling out.

ii. *Unpiling arms.*—In the last motion when the front rank turns about, the second and third ranks will stand fast.

3. Examples of Modified Platoon Company and Battalion Movements in "Threes"

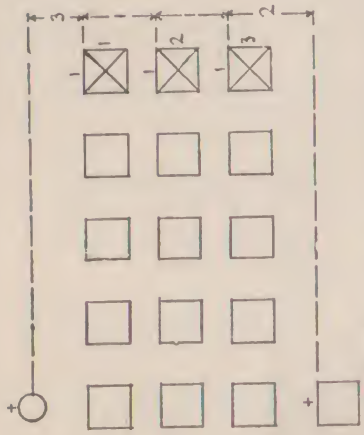
KEY TO PLATES



The Plates cover platoon, company, battalion and ceremonial drill, but do not show the details of platoon and company headquarter personnel:—

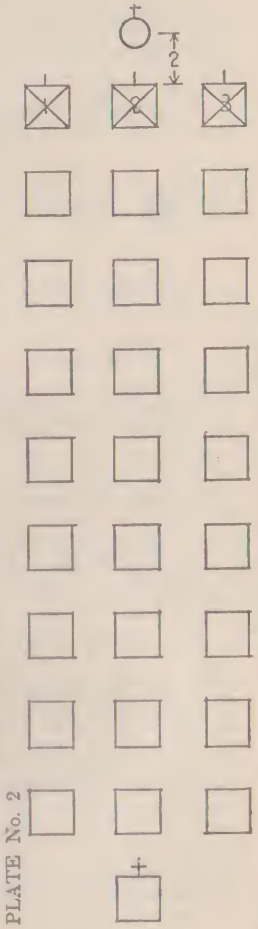
Plate No. 1.—Platoon in line in three ranks.
" " 2.—Platoon in column of route (threes).

Plate No. 3.—Company in line by platoons (training).
" " 4.—Company in line (ceremonial).
" " 5.—Company in column of route.
" " 6.—Company in close column (ceremonial).
" " 7.—Battalion in column of route.
" " 8.—Battalion in line.
" " 9.—Battalion in close column.



Platoon in line in three ranks.
Blank files will be in the second file from the left. Ranks will be at arms interval (handclosed).

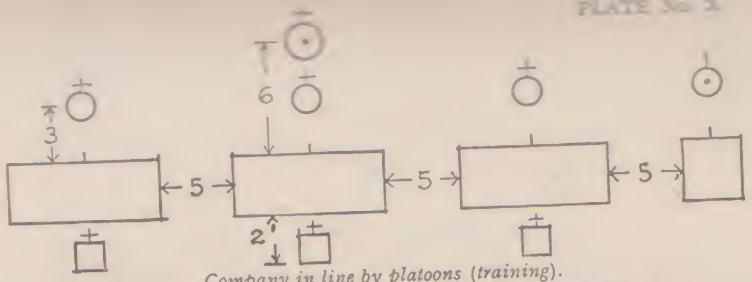
PLATE No. 1



Platoon in column of route (threes).

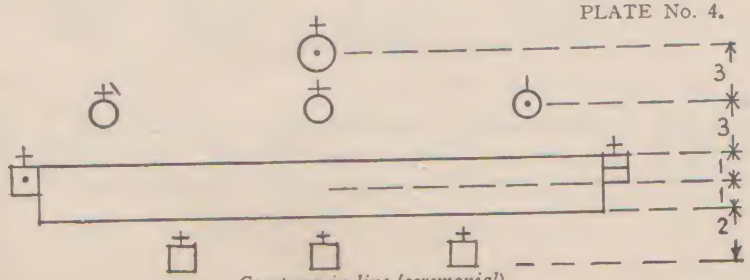
PLATE No. 2

PLATE No. 3.



Company in line by platoons (training).
Distances between ranks as laid down in platoon formations.

PLATE No. 4.



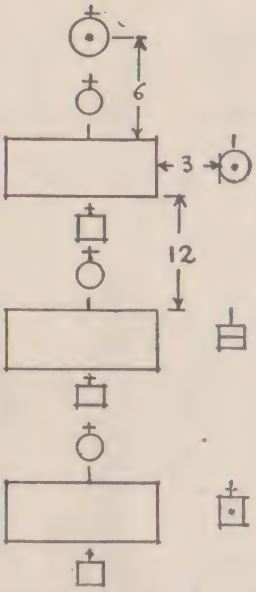
Company in line (ceremonial).

PLATE No. 5.

Company in column of route.

Transport in position according to orders issued.

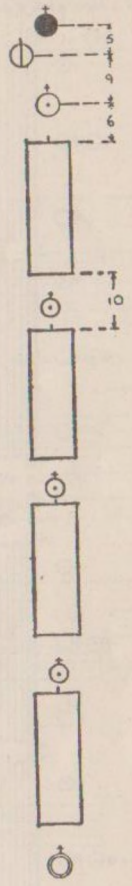
PLATE No. 6.



Company in close column (ceremonial).

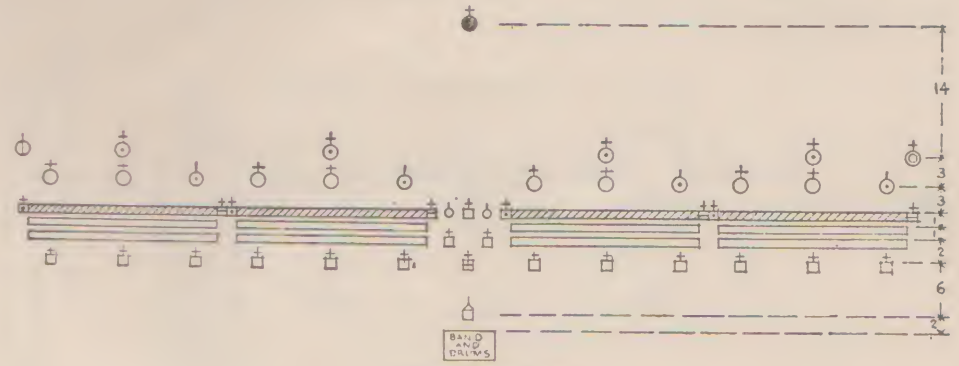
Distances between ranks, etc., as for platoon formations. For field training coy. H.Q. will fall in as required.

PLATE No. 7



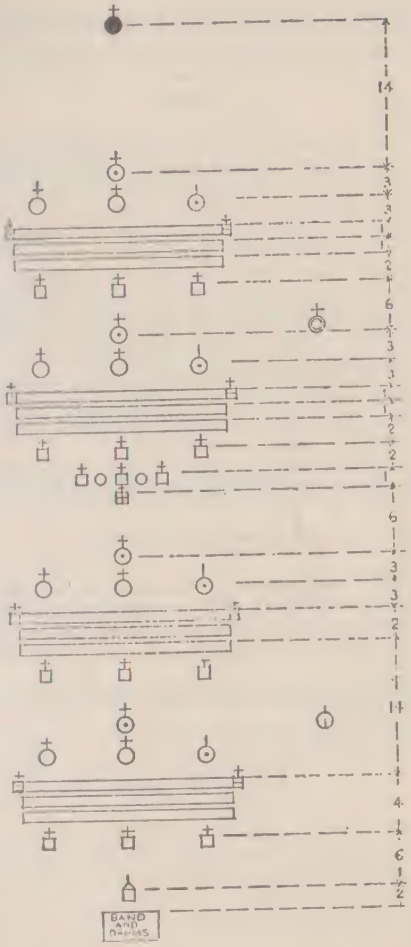
Battalion in column of route.
H.Q. Company will march in positions as detailed.
Transport will march in positions as detailed.

PLATE No. 8.



A battalion in line.

PLATE No. 9.



A battalion in close column.

CHAPTER TWO

INDIVIDUAL MOVEMENTS OF ELEMENTARY DRILL (*)

Manual of Elementary Drill (All Arms)

1. Attention

Squad—Attention.

Spring up to the following position:—Heels together and in line. Feet turned out at an angle of about 30 degrees. Knees straight. Body erect and carried evenly over the thighs, with the shoulders (which should be level and square to the front) down and moderately back—this should bring the chest to its natural forward position without any straining or stiffening. Arms hanging from the shoulders as straight as the natural bend of the arm will allow. Wrists straight. Hand closed but not clenched. Backs of the fingers touching the thigh lightly, thumb to the front and close to the forefinger, thumb immediately behind the seam of the trousers. Neck erect. Head balanced evenly on the neck and not poked forward, eyes looking their own height and straight to the front.

The weight of the body should be balanced on both feet and evenly distributed between the fore part of the feet and the heels.

The breathing must not in any way be restricted, and no part of the body should be either drawn in or pushed out.

The position is one of readiness in expectation of the word of command, and is that adopted when addressing, or being addressed, by a superior officer.

2. Standing at Ease

Stand at—Ease.

Carry the left foot about 12 inches to the left so that the weight of the body rests equally on both feet. At the same time carry the hands behind the back and place the back of the right hand in the palm of the left, grasping it lightly with the finger and thumb, and allowing the arms to hang at their full extent.

i. In marching order without the rifle the arms will be retained as in the position of attention.

ii. When a recruit falls in he will stand at ease after he has got his dressing.

3. Standing Easy

Stand—Easy.

The limbs, head and body may be moved but the man will not move his feet, so that on coming to attention there will be no loss of dressing. Slouching attitudes are not to be permitted. If either foot is moved men are inclined to lose their dressing.

On the caution *squad, etc.*, the correct position of stand at ease will be assumed.

Note:—(*) For squad, and larger, drill movements see manuals quoted, as may be modified by Chapter One of this Part. See also Plates 1 to 9 in same Chapter.

4. Turning by Numbers

1. **Turning to the Right—One.**

Keeping both knees straight and the body erect, turn to the right on the right heel and left toe, raising the left heel and right toe in doing so.

On the completion of this preliminary movement, the right foot must be flat on the ground and the left heel raised; both knees straight, and the weight of the body, which must be erect, on the right foot.

Two.

Bring the left foot smartly up to the right.

2. **Turning to the Left—One.**

As for above, except for *right* read *left* and vice versa.

Two.

Bring the right foot smartly up to the left.

3. **Turning About—One.**

Keeping both knees straight and the body erect, turn to the right-about on the right heel and left toe, raising the right toe and left heel in doing so, but keeping the right heel firmly on the ground.

On the completion of this preliminary movement the right foot must be flat on the ground and the left heel raised; both knees straight, and the weight of the body, which must be erect, on the right foot.

Two.

Bring the left foot smartly up to the right.

4. *Facing* is similar to turning, except that a half turn is made instead of a full turn.

5. Throughout all turns the arms must be kept close to the sides as in the position of attention.

6. In turning "judging the time" commands are *Right* (or *Left*) or *About—Turn, Right* (or *Left*) *In—cline;* the movements described above will be carried out on the command *Turn* or *In—cline,* observing the two distinct motions.

5. Length of Pace and Time in Marching

1. *Length of pace.*—In slow and in quick time the length of a pace is 30 inches. In stepping out it is 33 inches, in double time, 40; in stepping short, 21; and in the side pace, 12 inches.

When a soldier takes a side pace to clear or cover another (as in forming fours), the pace will be 24 inches.

2. *Time.*—*In slow time* 70 paces are taken in one minute. In *quick time* 120 paces, equal to 100 yards in a minute, are taken. Except during the first weeks of recruit training, recruits, when not in marching order, will take 120 paces a minute in quick time at drill.

In *double time* 180 paces, equal to 200 yards a minute, are taken.

Distances of 100 and 200 yards will be marked on the drill ground, and N.C.Os. and men practised in keeping correct time and length of pace.

6. Position in Marching*

1. In marching, the soldier will maintain the position of the head and body as directed in Sec. **1.** He must be well balanced. In slow time his arms and hands must be kept steady by his sides. In quick time the arms, which should be as straight as their natural bend will allow, should swing naturally from the shoulder, hands reaching as high as the waist belt in front and rear. Hands should be kept closed but not clenched, thumbs always to the front.

2. The legs should be swung forward freely and naturally from the hip joints, each leg as it swings forward being bent sufficiently at the knee to enable the foot to clear the ground. The foot should be carried straight to the front, and, without being drawn back, placed upon the ground with the knee straight, but so as not to jerk the body.

2A. Any tendency to turn the toes outwards will be checked.

3. Although several recruits may be drilled together in a squad with intervals, they must act independently, precisely as if they were being instructed singly. They will thus learn to march in straight line, and to take a correct pace both as regards length and time, without reference to the other men of the squad.

4. Before the squad is put in motion the instructor will take care that each man is square to the front and in correct line with the remainder. The recruit will be taught to take a point straight to his front, by fixing his eyes upon some distance object, and then observing some nearer point in the same straight line. The same procedure will be followed by the man on the named flank or by the named number, when marching in other formations.

7. Marching in Quick and Slow Time

1. *The quick march.*

The Squad will Advance. Quick—March.

The squad will step off together with the left foot, in quick time, observing the rules in Sec. **6.**

2. *The slow march.*

During recruit training squad drill should be frequently practised in slow time only. The executive word of command will be *Slow—March.* The men will step off and march as described for *Quick March,* but in slow time, and keeping the arms and hands steady at the sides, thumbs to the front. Each leg will be brought forward in one even motion and will be straightened as it comes to the front with the toes pointed downwards and placed on the ground before the heel.

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* The drum and pace stick are useful aids in teaching recruits to preserve a regular cadence and correct length of pace in marching, and they should be used frequently when available.

4. *The halt.*

Squad—Halt.

A pace of 30 inches will be completed with the left foot and the right foot brought up in line with it. At the same time the right hand will be cut smartly to the side.

5. *Stepping out.*

Step—Out.

The moving foot will complete its pace, and the soldier will lengthen the pace by three inches, leaning forward a little, but without altering the time.

This step is used when a slight increase of speed, without an alteration of time, is required; on the command *Quick* (or *Slow*)—*March* the normal length of pace will be resumed.

6. *Stepping short.*

Step—Short.

The foot advancing will complete its pace, after which the pace will be shortened by nine inches until the command *Quick* (or *Slow*)—*March* is given, when the normal length of pace will be resumed.

8. *Marking time.*

Mark—Time.

The foot then advancing will complete its pace, after which the time will be continued, without advancing, by raising each foot alternately about six inches, keeping the feet almost parallel with the ground, the knees raised to the front, the arms steady at the sides, and the body steady. On the command *For—ward*, the pace at which the men were moving will be resumed.

To slow time the feet should be raised twelve inches when marking time, the ball of the foot being immediately below the point of the knee, toes pointing downwards.

7. *Stepping back from the halt.*

[ ] Paces. Step back—March.

Step back the named number of paces of 30 inches straight to the rear, commencing with the left foot, keeping the arms still by the sides. Stepping back should not exceed four paces.

8. Changing Step

1. *When on the march.*

Change—Step.

The advancing foot will complete its pace, and the ball of the rear foot will be brought up to the heel of the advanced one, which will make another step forward, so that the time will not be lost, two successive steps being taken with the same foot.

2. *When marking time.*

Change—Step.

Make two successive beats with the same foot.

9. Marching in Double Time

1. *The double march.*

The Squad will Advance. Double—March.

Step off with the left foot and double on the toes with easy swinging strides, inclining the body slightly forward, but maintaining its correct carriage. The feet must be picked up cleanly from the ground, at each pace, and the thigh, knee, and ankle joints must all work freely and without stiffness. The whole body should be carried forward by a thrust from the rear foot without unnecessary effort. The heels must not be raised towards the seat, but the foot carried straight to the front and the toes placed lightly on the ground. The arms should swing easily from the shoulders and should be bent at the elbow, the forearm forming an angle of about 135 degrees with the upper arm (i.e. midway between a straight arm and a right angle at the elbow), fists slightly clenched, backs of the hands outwards, and the arms swung sufficiently clear of the body to allow of full freedom for the chest. The shoulders should be kept steady and square to the front and the head erect.

2. *The halt.*

Squad—Halt.

As in Sec. 7, 3, at the same time cutting away the hands to the position of attention.

3. *Marking time.*

Mark—Time.

Act as in Sec. 7, 6, the arms and hands being carried as when marching in double time, but without swinging the arms.

10. The Side Step

1. *Closing to the right* (or *left*).

Right (*or* **Left**) **Close—March,** *or* **. . . Paces Right** (*or* **Left**) **Close—March.**

Each man will carry his right foot 12 inches direct to the right, and instantly close his left foot to it, thus completing the pace; he will proceed to take the next pace in the same manner. Shoulders to be kept square. The direction must be kept in a straight line to the flank, and a uniform pause made after each pace. The number of specified paces should not exceed four.

4. *The halt.*

Squad—Halt.

The command *Halt* will be given when the number of paces has not been specified. The command will be given when the heels are together; the squad will then take a further pace in the direction ordered, and remain steady.

11. Turning When on the March

1. **Right** (*or* **Left**)**—Turn.**

On the command *Right* (or *Left*)*—Turn* the *left* (or *right*) foot will be brought forward until it is just in front of the *right* (or *left*) foot, and each man will then turn smartly in the required direction, using his *left* (or *right*) foot as a pivot, and advance a full pace of 30 inches in the new direction with the *right* (or *left*) foot.

The turn to the right must be made off the left foot and to the left off the right foot.

2. **About—Turn.**

Complete the pace with the right foot, then commence the turn with the left foot, the turn being completed in three beats of the time in which the soldier is marching. Having completed the turnabout, the soldier will at once move forward, the fourth pace being a full one and taken with the right foot.

In the case of a squad with a blank file, marching in line, the blank file will mark time two paces on the word *about*, thus gaining his position in the new front rank before the turn is completed. Guides should act in a similar manner.

3. **Right** (*or* **Left**) **In—cline.**

On the command *In—cline*, make a half turn in the required direction.

4. Turnings and changes on the march should always be preceded by a cautionary word of command, e.g., *The squad will move to the right—The squad will advance—Break into slow time—Diagonal march, etc.*

CHAPTER THREE

INDIVIDUAL MOVEMENTS OF ELEMENTARY DRILL WITH ARMS

1. Falling in With Rifles at the Order

The recruit will fall in with the rifle held perpendicularly at his right side, the butt on the ground, its toe in line with the toe of the right boot. The right arm to be slightly bent, the hand to hold the rifle at or near the band, back of the hand to the right, thumb against the thigh, fingers together and slanting towards the ground, elbow to the rear.

When each man has taken up his dressing, he will stand at ease.

2. To Stand at Ease and Stand Easy from the Order

1. *Standing at ease.*

Stand at—Ease.

Carry the left foot about 12 inches to the left so that the weight of the body rests equally on both feet. At the same time push the muzzle of the rifle smartly forward with the right hand, the right arm straight, and close to the side, without allowing the right shoulder to drop, toe of the butt remaining in line with the toe of the right boot, the left arm to be kept in the position of attention.

2. *Standing easy.*

Stand—Easy.

On the command *Stand—Easy,* the right hand will be slid up the rifle to the piling swivel and the men will act as in Sec. 3, Chapter II.

3. On the caution *Squad, etc.* the right hand will be slid down to the band, and the position of stand at ease assumed.

4. The above procedure is the same with or without bayonets fixed.

3. Attention from Stand at Ease

Squad—Attention.

The left foot will be brought smartly up to the right and the rifle returned to the *order.*

4. The Slope from the Order

Slope Arms—One.

Throw the rifle upwards with the right hand, catching it with both hands at the same time, left hand at the backsight, the right hand at the

small of the butt, thumb to the left, elbow to the rear, right arm nearly straight, rifle kept perpendicular, close into the right side, shoulders to be kept square.

Two.

Carry the rifle across the body, and place it flat on the left shoulder, magazine outwards from the body. As the rifle comes on the shoulder seize the butt with the left hand, the first two joints of the fingers grasping the upper side of the butt, the thumb about one inch above the heel, left elbow close to the side, forearm horizontal, and the heel of the butt in line with the centre of the left thigh.

Three.

Cut away the right hand to the position of *attention*. Rifle to be kept perfectly still.

5. The Order from the Slope

Order Arms—One.

Bring the rifle down to the full extent of the left arm, at the same time meeting it with the right hand where it is held at the order, arm close to the body. Butt not to be drawn to the rear.

Two.

Bring the rifle to the right side, steadying it at the time with the left hand at the nose cap, butt just clear of the ground.

Three.

Place the butt quietly on the ground, cutting the left hand away to the side.

6. The Present from the Slope

Present Arms—One.

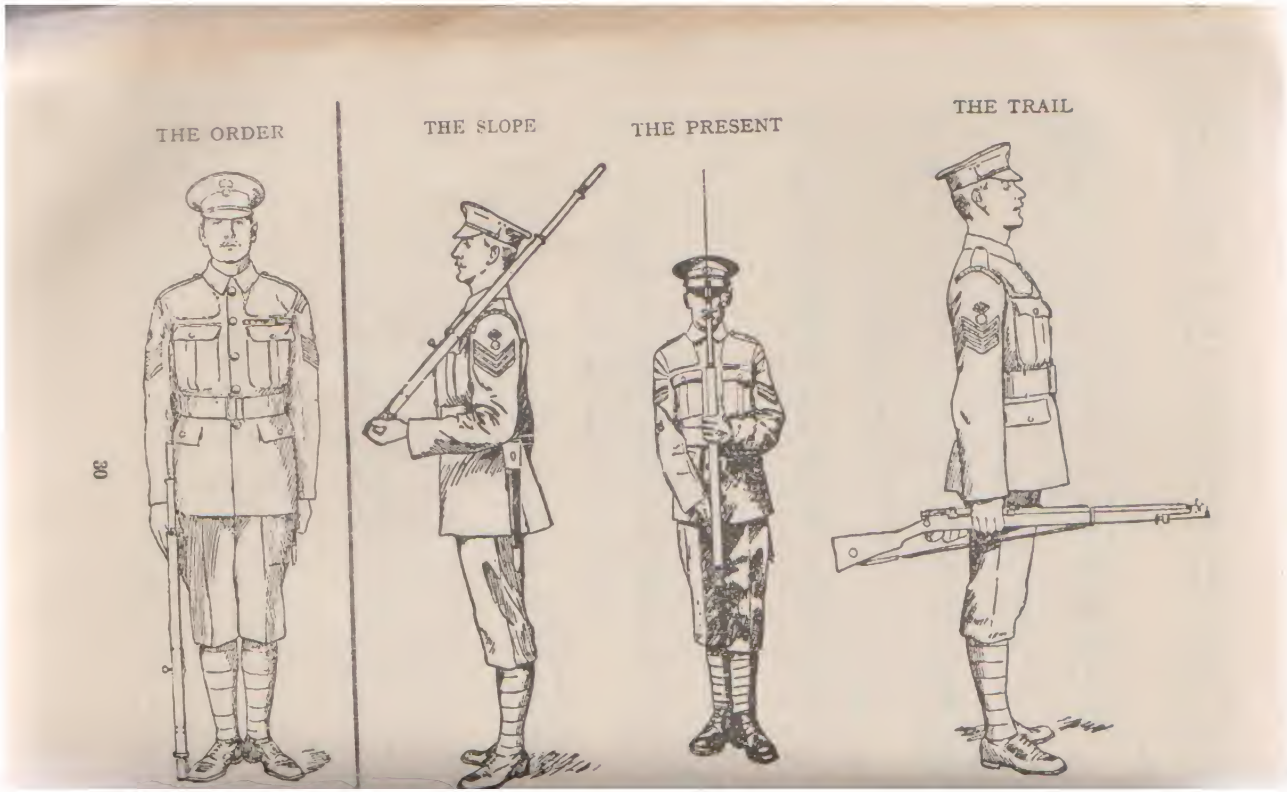
Grasp the rifle with the right hand at the small, forearm close to the body.

Two.

Raise the rifle with the right hand perpendicularly in front of the centre of the body, magazine to the left; at the same time place the left hand smartly on the stock, wrist on the magazine, fingers pointing upwards, thumb close to the forefinger, point of the thumb in line with the muzzle; the left elbow to be close to the butt, the right elbow and butt close to the body.

Three.

Guiding the rifle with the left hand bring the rifle down perpendicularly in front of and about three inches from the centre of the body, turning the magazine to the front, holding at the full extent of the right arm, fingers together slanting downwards, and meet it smartly with the left hand immediately behind the backsight, outside the sling, thumb pointing towards the muzzle; at the same time place the hollow of the right foot against the left heel, both knees straight. The weight of the rifle to be supported by the left hand.


THE ORDER
THE SLOPE
THE PRESENT
THE TRAIL

7. The Slope from the Present

Slope Arms—One.

Bring the right foot up in line with the left and at the same time place the rifle on the left shoulder as described in the second motion of the *slope* from the *order*.

Two.

Cut away the right hand to the side; rifle to be kept still.

8. Inspection of Arms

1. *Inspection of arms from the order.*

For Inspection, Port—Arms.

Throw the rifle, muzzle leading, with the right hand smartly across the body, magazine to the left and downwards, the barrel crossing opposite the point of the left shoulder, and meet it at the same time with the left hand close behind the backsight, thumb and fingers round the rifle, the left wrist to be opposite the left breast, both elbows close to the body.

Turn the safety catch completely over to the front with the thumb of the right hand. Pull out the cut-off, first pressing it downwards, with the thumb, then seize the knob with the forefinger and thumb of the right hand, and, taking the time from the right-hand man, turn it sharply upwards, and draw back the bolt to its full extent; then seize the butt with the right hand immediately behind the bolt, thumb pointing to the rear. (For Ross Rifle, see Section 19)

2. *To ease springs.*

Ease Springs.

From the position described above, work the bolt rapidly backwards and forwards until all cartridges are removed from the magazine and ejected,* allowing them to fall to the ground, then close the *cut-off* (not with S.M.L.E. Mark III* rifles, which have no *cut-off*) by placing the right hand over the bolt and pressing the *cut-off* inwards, then close the bolt, press the *trigger*, turn the *safety catch* over to the rear with the first finger of the right hand, and return the hand to the small, keeping the forefinger along the outside of the trigger guard and not round the small of the butt.

3. *To order arms from the port.*

Order Arms—One.

Holding the rifle firmly in the left hand, seize it with the right hand where it is held at the order.

Two.

As in the second motion of the *order* from the *slope*.

Three.

As in the third motion of the *order* from the *slope*.

[4. To fire a salute.—It is presumed that five rounds are in the magazine and chamber.

4. *To slope arms from the port.*

Slope Arms—One.

Place the rifle on the left shoulder as described in the second motion of the *slope* from the *order* (Sec. 4).

Two.

As in the third motion of the *slope* from the *order.*

9. Instructions for inspecting arms

1. When arms are inspected at the *port* only, as in inspecting a platoon on parade, the officer, warrant officer, or N.C.O. will see that the exterior of the rifle is clean and free from rust; that the magazine and action are clean and in good order; that the sights are at zero; and that no parts are loose or damaged. He will here and there examine the bore of a rifle to see that it has been cleaned and is free from obstructions.

2. Each soldier, when the officer, warrant officer or N.C.O. has passed the file next to him, will, without further word of command, *ease springs, order arms* and *stand at ease.*

10. To Examine Arms

Examine—Arms.

Both ranks, being at the *port,* will come to the position for loading (*see* Chapter VII, Section 13), with the muzzle so inclined as to enable the officer, warrant officer or N.C.O. to look through the barrel, the thumbnail of the right hand being placed in front of the bolt to reflect light into the barrel.

The soldier, when the officer, warrant officer or N.C.O. has passed the next file to him, will act as detailed in Sec. 9, 2.

i. If it is necessary to examine arms, the men, when in the position of *for inspection, port arms,* will be cautioned to remain at the *port.*

ii. In ordering arms from the examine, the first motion will be to seize the rifle with the right hand where it is held at the *order,* at the same time bring the left foot back to the right. With the second motion the rifle will be brought to the right side, the left hand steadying the rifle, as in the second motion of the *order* from the *slope.* The third motion is the same as the third motion of the *order* from the *slope.*

11. The Trail from the Order

The *trail* is not normally used in close order drill except by rifle and English light infantry regiments. It will be used, however, in the field.

Trail—Arms.

By a slight bend of the right arm give the rifle a cant forward and seize it at the point of balance, bringing it at once to a horizontal position at the side at the full extent of the right arm, which should hang easily from the shoulder, fingers and thumb round the rifle.

12. The Order from the Trail

Order—Arms.

Raise the muzzle, catch the rifle at the band and come to the *order*.

13. The Trail from the Slope

Trail Arms—One.

Keeping the rifle in the position of the *slope*, seize it at the point of balance with the right hand.

Two.

With the right hand bring the rifle to a horizontal position at the right side (as in Sec. 11), at the same time cutting the left hand to the side.

14. The Slope from the Trail

Slope Arms—One.

With the right hand place the rifle on the left shoulder in the position of the *slope*, at the same time seizing the butt with the left hand as in the second motion of the *slope* from the *order* (Sec. 4.)

Two.

Cut away the right hand to the side.

15. To Change Arms When at the Slope

Change Arms—One.

Seize the butt of the rifle with the right hand, back of the hand up, at the same time slipping the left hand up to the small.

Two.

Lower the rifle, turning the magazine outwards, on to the right shoulder, bringing it well to the front, so as to clear the head.

Three.

Cut the left hand to the side.

To change arms from the right to the left shoulder act as above, reading *left* for *right*, and *right* for *left*.

16. To Change Arms When at the Trail

Change Arms—One.

Bring the rifle to a perpendicular position in front of the right shoulder, supporting to the front, upper part of the arm close to the side, forearm horizontal, hand in line with the waist-belt.

Two.

Pass the rifle across the front of the body, catching it with the left hand at the point of balance, at the same time cutting the right hand smartly to the side. In this position the rifle is to be held perpendicularly

and opposite the left shoulder, magazine to the front, upper part of the left arm close to the side, left forearm horizontal, hand in line with the waist-belt.

Three.

Lower the rifle to the full extent of the left arm at the *trail*.

To change arms from the left to the right act as above, reading *left* for *right* and *right* for *left*..

17. The Short Trail

No word of command.

Raise the rifle about three inches from the ground, keeping otherwise in the position of the *order*.

If standing with ordered arms, and directed to form fours, to close to the right or left, to step back, or to take any named number of paces, men will come to the *short trail*.

18. To Sling Arms

1. *With unfixed bayonets.*

Sling—Arms.

The sling of the rifle having been loosened to the full extent, the soldier will pass his head and right arm between the sling and rifle, muzzle upwards, the rifle hanging diagonally across the back.

2. *With fixed bayonets.*

Sling—Arms.

The sling of the rifle having been loosened sufficiently, the rifle will be slung by passing the sling over the right or left shoulder, with the rifle hanging in a perpendicular position behind the shoulder.

The rifle will be carried slung by dismounted signallers, brakesmen and drivers leading pack animals.

19. Drill with the Ross Rifle

1. For weapon training purposes, a (Canadian) "Supplement for the Ross Rifle" has been issued, to cover essential differences between that weapon and the Lee-Enfield, to be read in conjunction with S.A.T. Vol. I, Pamphlet No. 3. While definitely necessary for musketry detail, as a matter of safety, it has not been considered that a similar set of amendments is required for the ordinary manual of arms. It will be obvious, however, that some minor details of grip or manipulation will require to be changed when Ross rifles are used for drill; such changes should be dealt with by instructional personnel as occasion may arise.

GENERAL NOTE.—It is emphasised that all the foregoing detail covers individual drill only. For squad, platoon and company movements with arms, see the manuals quoted as references, as modified by Chapter One of this Part.

CHAPTER FOUR

HOW AND WHEN TO SALUTE

[illegible] Elementary Drill (All Arms) 1935

1. How to Salute; Without Arms

[illegible]

[illegible] motion to head, palm to front, [illegible] an inch above right [illegible] as in illustration, thumb close to [illegible] with shoulder, tips of fingers, [illegible]

[illegible]

[illegible] making a pause equal [illegible]

[illegible] as in para. 1, [illegible] hand is brought to salute, [illegible] officer or instructor saluted [illegible]

[illegible] *left* and *Eyes—front*, squads will turn [illegible] as left foot comes to [illegible] for a squad with arms.

2. When to Salute; Without Arms

[illegible]

[illegible] will salute on third pace before [illegible] third pace after passing him. During [illegible] the officer full in the face.

[illegible] the man nearest to the officer will give [illegible]

SALUTING TO THE FRONT

2. *When sitting.*

A soldier, if sitting when an officer approaches, will stand at *attention*, facing the officer, and salute with the hand; if two or more men are sitting or standing about the senior warrant officer, N.C.O., or oldest soldier will face the officer, call the whole to *attention*, and alone will salute (as above).

3. *When addressing or delivering a message to an officer.*

When a soldier addresses or delivers a written message to an officer he will halt two paces from him and salute to front as taught.

When appearing before an officer in a room, he will salute without removing his cap.

4. *When without a cap, etc.*

A soldier without his cap, or when carrying anything other than his arms, will not salute, but will, if standing still, come to *attention* as an officer passes; if walking, he will turn his head smartly towards the officer in passing him, keeping his arms steady by the side.

5. *When riding a horse of a team in a wagon or limber, or when driving a horsed vehicle.* (See Manual of Horse-mastership, Equitation and Driving, 1929.)

6. *When driving a mechanical vehicle (including bicycles).*

The rider of a bicycle (pedal or motor) or driver of a mechanical vehicle, will not salute when the vehicle is in motion, owing to the danger of taking the eyes off the road.

When the vehicle is stationary, he will salute by turning his head smartly towards an officer passing him, but will not remove his hands from the handlebar or steering wheel.

7. *When seated on or in a horsed or mechanical vehicle.*

Soldiers will sit at attention and, if facing the direction in which the vehicle is moving, will salute by turning the head and eyes in the direction of the officer. If seated facing in any other direction, they will look straight to their own front.

3. How to Salute with the Rifle (at the Slope)

1. *Saluting to the front.* (See Plate, page 38.)

(1) By numbers.

Carry to Numbers—One.

Bring right hand smartly to butt, forefinger just below small of butt, forearm horizontal, back of hand uppermost, fingers straight, thumb close to fingers.

Two.

Cut away the arm smartly to side by shortest way.

(2) Judging the time.

THE SALUTE WITH THE RIFLE AT THE SLOPE

Salute, Judging the Time—Salute.

Go through the motions as in para. 1. (i) above, making a pause equal to two paces in quick time between each motion.

3. Saluting to the side.

Saluting to the side when on the move is carried out as in para. 1, above, on command *Salute,* except that, as hand is brought to salute, the head will be turned smartly towards the officer or instructor saluted as the hand comes to ground.

4. When to Salute When Carrying a Rifle

1. At the halt

A soldier, at halted, will salute as follows:—

(i) If at the *order* when officer passes he will turn towards officer and stand to *attention*.

(ii) If at the slope when officer passes he will salute as taught. The salute will begin three paces before the officer passes the soldier and the hand will be cut away on third pace after he has passed him.

2. On the move.

When a soldier, carrying a rifle, passes an officer, he will do so at the [illegible] and will salute as taught, at the same time turning the head towards the officer saluted and looking him full in the face. He will salute on the [illegible] pace before reaching him, and will cut the hand away and turn the [illegible] to the front on the third pace after pasing him.

3. In carrying messages to or addressing officers.

When a soldier, carrying a rifle, delivers a written message to or addresses an officer he will do so at the *slope*. Unless the officer is on the move, the [illegible] will halt two paces from the officer, salute as taught and deliver the message; if no reply is needed or when the reply is received, he will [illegible] as before, turn about and march off in quick time.

CHAPTER FIVE

MARCHES AND MARCH DISCIPLINE

Infantry Section Leading. Infantry Training. Manual of Elementary Drill, all arms

NOTE:—Under this heading, marching by day has been treated only as concerns the problem of getting a body of troops from one point to another, under their own power, with a minimum of normal road casualties. As regards the hazard of enemy action in war, the commander is also fully responsible for the necessary measures for "Protection when advancing", as detailed in Infantry Training, 1937, Section 58.

1. Points Which Require Attention on the March

1. *Before leaving barracks, billets, bivouacs, etc.*—

Equipment must be inspected to see that, as well as being in order, it is correctly fitted. Loose, badly fitting equipment causes chafes, and is very tiring if worn for long periods.

2. *On the line of march.*—

(i) March discipline must be strictly enforced. Men should keep in step and be properly covered off. A steady, even pace must be maintained and no doubling to regain lost distance should be allowed.

(ii) At the hourly halt all men except those detailed for protective duties must take off their equipment (except the respirator) and lie down.

(iii) Sections should change places after each hourly halt. This prevents the same men marching on the side of the road—probably in the gutter.

(iv) Indiscriminate drinking from water bottles must be stopped. Men should be allowed to rinse out their mouths during the hourly halt under the supervision of an N.C.O.

(v) Smoking should be restricted.

(vi) In hot weather, collars of jackets should be undone, and the sections opened out as much as possible.

(vii) When circumstances permit, singing should be encouraged as this helps to relieve the boredom of the march.

3. *After a march when barracks, billets, or bivouacs have been reached.*—

(i) If possible, all men should be made to wash their feet, after which N.C.Os. should hold a foot inspection to see that men with blistered feet are attended to. Ordinary blisters can be treated on the spot with iodine and foot-powder, but men with very badly blistered feet should be ordered to report sick to the medical officer.

The N.C.O. should then look to see whether boots fit and are soft; that socks are the right size and free from holes or large badly made darns, both of which cause blisters; if fresh socks are not available, that the dirty ones are changed to the opposite feet.

(iii) Arms, equipment and clothing must be inspected to see that they are in good order. Any deficiencies should be reported at once to the platoon commander.

(iv) Men should be warned not to drink water from an unauthorized source. They should be shown where clean or sterilized water can be obtained.

(v) Finally when his men have been fed, the section commander should see that their sleeping quarters are as comfortable as circumstances will permit.

3. The good N.C.O. is always in evidence after a really tiring day. Whilst the indifferent leader of men will probably be busy seeing to his own comfort, the good leader will be looking after the comfort of his men.

4. For full detail of march hygiene, see Chapter IX of "Army Manual of Hygiene and Sanitation".

2. Importance of March Discipline

1. Units of all arms must be capable of undertaking long and rapid marches in war without loss of numbers and energy. March discipline includes everything which affects the efficiency of men, animals and vehicles before, during and after a march. It involves close and constant attention to many points of administration before and after every march, and to a number of rules during the march itself. In a well trained unit these rules should be so well understood that correct procedure is carried out automatically and all action during the march and at halts is taken quickly and quietly.

2. Slackness in march discipline not only causes discomfort in the unit and loss, but may cause disaster through troops arriving late or too exhausted to take an effective part in battle, or through roads becoming congested and blocked. The importance of march discipline cannot therefore be overstated and all ranks must realize their responsibility in co-operating to maintain the necessary high standard.

3. March discipline which breaks down at a time of crisis is of little value; the longer and more trying the march, the more strictly must it be enforced.

3. Halts

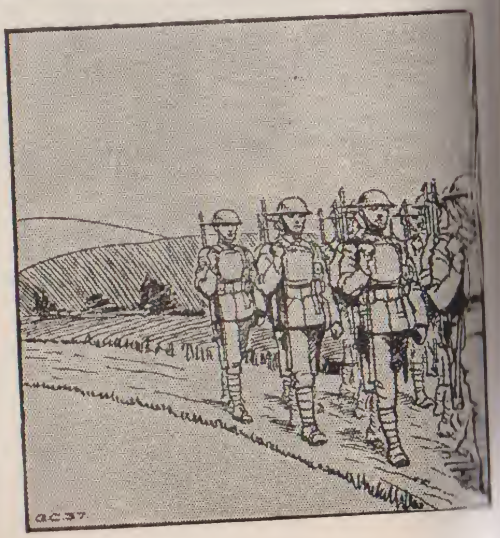
1. A warning whistle will be sounded one minute before each halt, when troops will march at attention. The signal or command to halt will be given by commanders of squadrons, batteries and companies; troops will await orders before falling out.

2. Units will fall out on the side of the road on which they are marching except that when the situation permits officers may fall out on the other side.

3. At long halts latrine trenches should invariably be dug.

4. A warning whistle will be sounded one minute before the end of the halt. Troops will be formed up (and mounted in the case of mounted troops and transport) ready to advance on the signal or command being given by commanders of squadrons, batteries and companies.

Good march discipline must be observed at all times, particularly when men are tired and at night.



Good march discipline lightens a night march.

4. Night Marches

1. The route for a night march should, when possible, be reconnoitred both by day and night. Branch roads or other places where the column might go astray, and points where checks are likely to occur, will be noted and clearly marked, as will also the starting-point for the column. If the march is to be made across country, the route will be fixed by compass bearings. Landmarks which are visible by night will be noted and the distance between those that lie on the line may be checked. In addition to the officers responsible for guiding the column, it is advisable to detail an officer to check the distance marched and the progress of the column with reference to the landmarks which have been noted. Where the country is featureless, it may be necessary to post men at certain points along the route, particularly at places where a change of direction has to be made; they will be given the compass bearing and the distance to the next post.

2. It is best to retain the regulation distances between units, in order to prevent constant checks throughout the column; but they may on very dark nights be reduced or omitted. An officer will invariably march in rear of each unit. Touch should be maintained throughout the column, connecting files being used as necessary. The time and periods of halts will be arranged before starting; no unit will halt until it has regained the distance that it may have lost. During halts men may lie down, but should not leave the ranks.

3. It is not safe to calculate on a large force averaging more than two miles an hour; the darker the night, the slower will be the pace.

4. The above instructions apply generally to all marches by night, whether or not the column is protected by the dispositions of other troops. If it is not, and there is any possibility of the enemy being encountered, advanced flank and rear guards will be detailed. Their size and their distance from the column will vary according to the ground and to the darkness of the night. They need usually only be large enough and at a sufficient distance to prevent small bodies of hostile troops from interfering with the march; if the enemy is likely to be met in any strength, night marches should not be undertaken in column of route, from which it is difficult to deploy quickly in the dark without confusion. In enclosed country the flanks are best protected by posts placed in position by the advanced guard and withdrawn by the rear guard; in open country flanking patrols may sometimes be used instead of stationary posts, but men are liable to lose direction unless accustomed to night work.

5. The advanced guard will usually be responsible for blocking all branch roads which are not to be used; either by posting men or by placing some pre-arranged block across them (*e.g.*, a line of stones or the branches of trees); if men are posted, they will be withdrawn by the rear guard.

6. When passing an obstacle or defile, where opening out is likely to occur, the column will advance about its own length and then halt until the rear has closed up.

No more transport should accompany the column than is absolutely essential, and the extent to which M.T. is able to move without lights will depend on the darkness of the night. The factor of noise must be borne in mind.

5. If the march is being made to an assembly position as a prelude to a night advance or night attack, this position will be carefully reconnoitred and should be so selected (at or near some well-defined natural feature) or so marked as to be unmistakable at night. It should be secured by advanced troops in good time beforehand.

6. All ranks will be informed what their action is to be in the event of alarm or attack, or of an aeroplane dropping a flare. Rifles will not be loaded, but magazines will be charged; no firing will take place without orders. Silence will be maintained, and no smoking, striking of lights, or use of electric torches will be allowed, except by permission of the commander of the force.

CHAPTER SIX

PHYSICAL TRAINING

Physical Training 1937. Special Tables
(P.T. Without Apparatus)

1. Object

1. As the object of military training is to prepare the Army for war, so the object of Physical Training is to *make* and *keep* the Army physically fit for war.

2. Principles

1. The fighting spirit, discipline, efficiency and esprit-de-corps of a unit are bound up with the physical fitness of its personnel. Physical fitness implies a sound and active mind in a fit and healthy body, and is the only foundation upon which the qualities essential in a soldier can be built up and developed.

2. Broadly speaking, mental and bodily fitness are both the product of exercise, mental and physical, suitably regulated to the existing development and condition of the individual.

3. Every form of military training entails mental and physical exercise. It is the object of educational training to ensure uniformity on the purely mental side; whereas uniformity of physical development and co-ordination of mind and body are ensured by recreational games and sports of an athletic nature, combined with physical training exercises scientifically designed to this end.

4. The term physical training therefore embraces:—

(a) Recreational physical training.
(b) Physical training exercises.

5. Recreational physical training in the army includes:—

Gymnastics.
Fencing of all kinds (including Bayonet).
Boxing.
Swimming.
Wrestling.
Athletics generally.

3. Application

1. The application of the above principles to the young soldier can be summed up in the following three-way statement:—

(a) You don't creak in your joints yet, so you can do P.T. *easily* and
(b) You probably like games, anyway.

(*b*) It is impossible for you to carry out a proper continuity of daily P.T. without getting *some* benefit out of it, and the more honest vim you put into P.T., the easier to perform will be your other military duties.

(*c*) More than in almost any other work, the thing for the clever soldier to do in P.T. is to swim with the tide. If you approach it in a spirit of resistance or boredom, you won't like it. If you sensibly accept its long-proved benefits in the proper spirit, as an institution designed to stimulate your sense of well-being, you *will* enjoy it, and reap its good effects the sooner.

NOTE:—See also "Games, etc.", Chapter XXIV.

PART TWO

WEAPON TRAINING

	Page
CHAPTER VII—The Rifle	47
VIII—The Theory of Small Arms Fire	69
IX—Annual Range Course (Rifle)	76
X—Anti-Aircraft	80
XI—The Bayonet	89

CHAPTER SEVEN

THE RIFLE

(Two are dealt with—"Lee-Enfield" and "Ross")

1. General

1. **Characteristics.**—When cared for and handled correctly, the rifle is:—
   (a) Capable of a high and accurate rate of fire.
   (b) Suitable, with the bayonet, for hand-to-hand fighting.

2. **Training Standard.**—Instruction is designed to make the soldier:—
   (a) A steady and accurate shot.
   (b) A quick shot at targets appearing at short and indefinite intervals.
   (c) A handyman with the rifle, able to fire bursts of 5 to 10 rounds at a rapid rate.

3. **Exceptions as to make of rifle.**—Excepting as specially noted in this [illegible] under "WEAPON TRAINING" applies equally to [illegible]

2. Mechanism and Cleaning

4. [illegible] To teach the soldier from the beginning of his service that he [illegible] care of his weapons so that they are in working order

THE LEE-ENFIELD RIFLE

Small Arms Training, Volume I, Pamphlet No. 3, Rifle, 1937

3. Mechanism

1. For general working, see descriptive illustrations, Plates I to IV.

4. Removing and Replacing Bolt

1. *To remove:—*
   (i) Push forward safety catch. Pull out cut-off by pressing downwards and outwards.
   (ii) Raise knob as far as it will go; draw back bolt head to resisting shoulder; release it from retaining spring.
   (iii) Raise bolt head as far as possible and remove bolt.

2. *To replace:—*
   (iv) Ensure that number on bolt and on rifle correspond and that safety catch is forward. Bolts of rifles must not be exchanged, as in the Lee-Enfield rifle the wrong bolt may affect accuracy.
   (v) See that resisting lug and cocking-piece are in straight line and bolt head screwed home.
   (vi) Place bolt in body with extractor uppermost and push forward until head is clear of resisting shoulder.
   (vii) Turn bolt head over to right, pull back, then press bolt head down until caught by retaining spring.
   (viii) Close cut-off, close breech, press trigger, apply safety catch, and ensure bolt lever is fully down.

5. Removing and Replacing Magazine

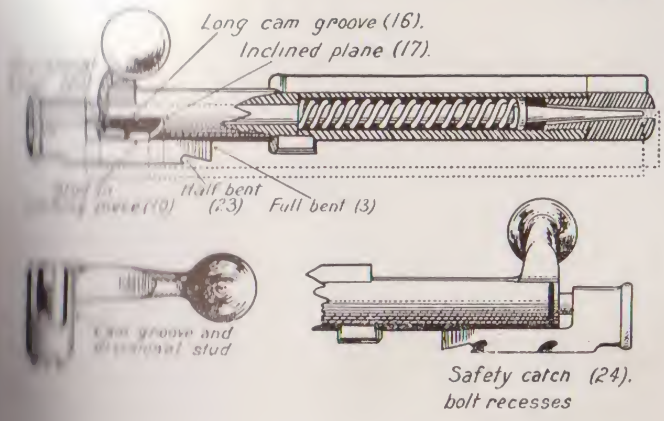
1. To remove.—Depress magazine catch inside trigger guard and withdraw magazine. Magazine must not be removed except for cleaning.

2. To replace.—Put front end of magazine in first and press upwards until catch is engaged.

6. Half-cock and How to Re-cock

1. At half-cock trigger cannot be pressed nor bolt be rotated until action is placed at full-cock by drawing back cocking-piece. Ascertain if chamber is empty before trigger is finally pressed.

NOTE:—Leaf and slide of backsight will be lowered and cocking piece forward when rifle is not in use.



Action of Bolt and Cocking Piece.

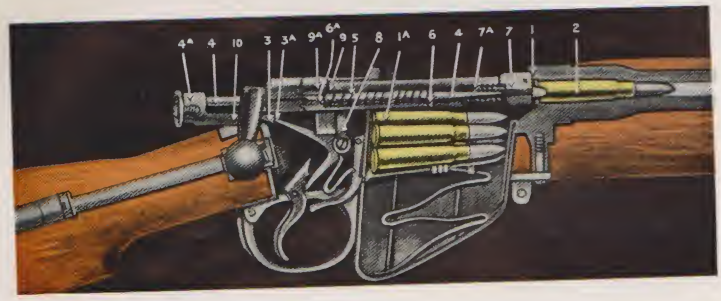
The illustration shows the stud on the cocking piece in the short cam groove.

Safety Device.—At the rear end of the bolt, between the long and short cam grooves, is the divisional stud (**22**), which comes into operation when the bolt is not properly closed. If the trigger is pressed when the bolt lever is not completely down, three functions may take place.

First.—The stud on the cocking piece strikes full against the divisional stud preventing the striker from flying forward. If the bolt is now turned down the action will be locked or "half cocked." The turning of the bolt causes the stud on the cocking piece to slip off and round the right-hand side of the divisional stud into the long cam groove; the striker could now fly forward and explode the charge, but the nose of the sear is ready to arrest its forward movement by engaging in the half bent, in which position the trigger cannot be pressed and the bolt opened until the cocking piece is pulled back.

Second.—The stud on the cocking piece strikes on the right-hand side of the divisional stud which causes the bolt to close automatically and the charge is fired.

Third.—The stud on the cocking piece strikes on the left-hand side of the divisional stud, causing the bolt to fly open, as the stud on the cocking piece has passed the short cam groove and the mainspring was under compression. The charge cannot be fired.

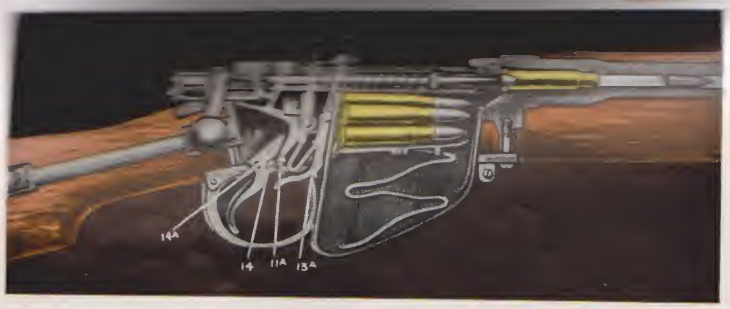


What Happens When the Bolt is Pushed Forward.

The face of the bolt head (**1**) comes into contact with the base of the topmost cartridge in the magazine (**1a**), which, by the forward movement of the bolt, is carried into the chamber (2). During this forward movement the full bent (**3**) of the "cocking piece" (**4a**) comes against the nose of the sear (**3a**), thus arresting its forward travel; and as the striker (**4**) is attached to the "cocking piece" (**4a**) the mainspring (**5**) is compressed between the collar on striker (**6**) and the rear wall of the bolt chamber (**6a**).

What Happens When the Bolt Knob is Turned Down.

The bolt head (**7**), which is a separate component, is attached to the bolt by means of a screwed tenon (**7a**), and is prevented from rotating when the bolt is turned by the hook on the bolt head extension which travels along the body rib, and which, when the bolt is withdrawn to its full extent, snaps over the retaining spring (**8**). The rear end of the bolt rib (**9**) turns down over the [illegible] (see **Plate IV, 15**) travels up the inclined groove on the left-hand side of [illegible] the long cam groove is brought opposite the stud of [illegible] safety catch, if applied, when

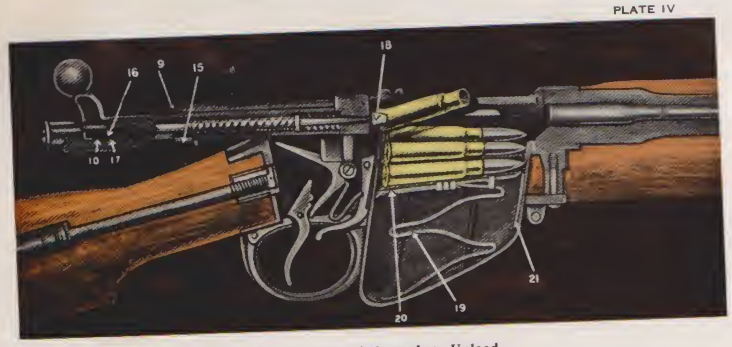


The upper limb of the sear (**11**) is retained in its upward position by means of the longer limb of the sear spring (**12**), the short limb of the sear spring (**13**) acting on the magazine catch (**13a**).

What Happens When the Trigger is Pressed.

When pressure is applied, the lower rib on the trigger (**14**) acting on the lower limb of the sear (**11a**) draws down the upper limb of the sear (**11**) until the sear nose is at the bottom of the full bent; this is the "first pull." When "the second pressure" is taken, the second rib on the trigger (**14a**) draws down the upper limb of the sear still farther until the sear nose is free of the full bent, thus releasing the cocking piece and striker, which fly forward owing to the expansion of the mainspring. The striker nose, which protrudes through the face of the bolt head, striking the cap in the cartridge, explodes the charge.

NOTE:—*Arrow 23 above indicates the "half-bent of cocking-piece". For mechanical detail, refer back to diagram: "Plate I".*



What Happens When the Bolt Knob is Turned Upwards to Unload.

The rear end of the bolt rib (**9**) is freed from the resistance shoulder, and the resistance lug (**15**) travels down the inclined groove on the left hand side of the bolt way; this brings about "primary extraction," and causes the whole of the bolt to be withdrawn about one-eighth of an inch. At the same time the stud on the cocking piece (**10**) is forced from the long cam groove (**16**) up the inclined plane (**17**) into the short cam groove, thus withdrawing the striker about one-eighth of an inch (see Action of Bolt and Cocking Piece).

What Happens When the Bolt is Withdrawn.

The [illegible] is held in close contact with the rim of the cartridge by means of the extractor spring, withdraws the [illegible] until the head of the cartridge case comes against the ejector screw (on the left of body in [illegible] the W-shaped spring (**19**) [illegible] of the bolt

THE ROSS RIFLE

S.A.T., Vol I, Pamphlet No. 3, 1937, Canadian Supplement for the Ross Rifle, 1940.

7. Special Features

NOTE.—Issues are normally of the Mark III pattern. The chief differences found in the Mark II pattern are as follows:— Bolt head is 2 solid lugs instead of 7-blade screw, and locks flat instead of vertical. Magazine does not project below stock. Has burr-head bolt stop, and no cut-off. The backsight is, in most cases, on barrel, not behind charger guide.

1. In relation to the Lee-Enfield, the features of difference in the Ross are as follows:—

(a) Straight pull bolt action.
(b) Breech locked by engagement of screw-lug bolt head with screwed recesses in receiver.
(c) No "half cock".
(d) Magazine non-removable except by armourer.
(e) "Aperture" sight.
(f) Longer sighting base by use of charger-guide backsight.
(g) Extra length and weight.
(h) Compression of mainspring on *backward* movement of bolt.
(i) Bolt stop and magazine cut-off combined.
(j) Shorter, "bread-knife" bayonet.
(k) Hand guard not continued beyond lower band.
(l) One-piece stock.

8. Removing and Replacing Bolt Action

1. To remove:—

(a) Turn safety catch to "Ready" and bolt stop to intermediate position.

(b) By straight sharp pull on bolt sleeve handle, withdraw bolt action clear of rifle. The initial manual force is necessary to overcome resistance of the mainspring, which is compressed on this *backward* movement.

2. To replace:—

(a) If safety catch, if its reading has since been altered for cleaning, must again be turned backwards to "Ready." *Never attempt to replace return of bolt action with safety-catch at "Safe."* See that bolt stop is again at intermediate position.

(b) With bolt action fully extended hold it in a (right) overhand grip, thumb and forefinger well forward on sleeve, remaining behind turned handle, and, keeping action parallel with bore, engage flats of bolt head squarely on flats of receiver guides

With firm downward and slight lateral-right pressure, push carr fully forward until (first) sleeve guideways engage receiver guide and (second) bolt head emerges under charger guide; then changing to thumb-and-finger grip of handle only, send action smartly and *fully* home. (Emphasis on latter is explained in Lesson to Load.)

(v) Turn down bolt stop, press trigger and push safety catch forward to "Safe."

IMPORTANT NOTE.—*The bolt itself is not to be removed from the sleeve* except by an armourer. Under no circumstances is the "Bolt Action, complete" to be in any way stripped or tampered with by the soldier. The importance of this is emphasized in the appended—

9. *CAUTION* on Ross Bolt; Not to be Stripped

If the Ross bolt action *has* been taken apart (contrary to regulations) by an individual unauthorized to do so and unfamiliar with its mechanism it is possible by use of undue force to introduce a wrongly assembled bolt and sleeve into the receiver. The bolt action is then apparently closed but is not really locked. If rifle is fired in this condition, the bolt will be blown into the face of the firer. ALWAYS SEE THAT YOUR ROSS RIFLE BOLT ACTION IS CORRECTLY ASSEMBLED. If not you, somebody else may have tampered with the rifle.

How to tell if bolt is properly assembled.

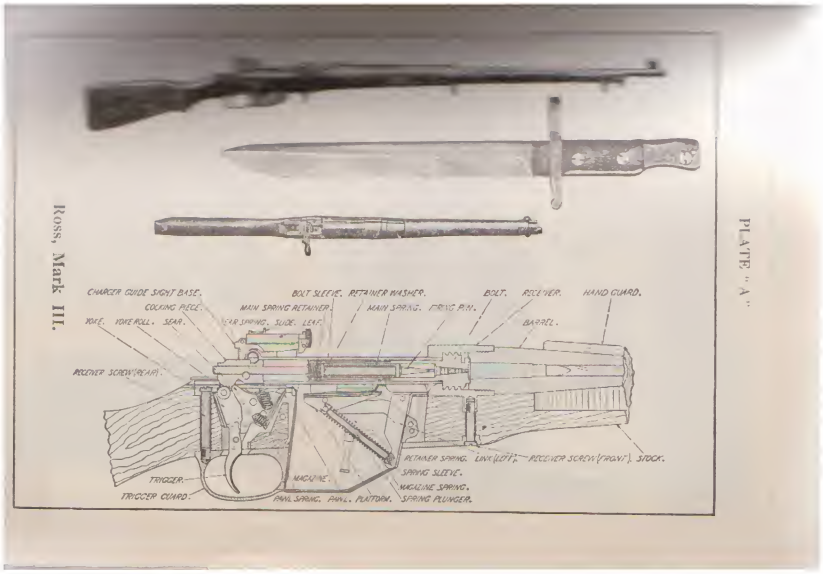
Hold the rifle with muzzle away from the body, open breech and look at bolt. Without removing bolt action, look at bolt head, then look at *sleeve*, which is that part of bolt action which covers most of the mechanism and bears the bolt sleeve handle at rear end. *When breech is open, if bolt head is nearly one inch from front end of sleeve, the bolt action is correctly assembled.*

If incorrectly assembled it will be seen that the bolt head is less than *one quarter* of an inch from the front end of sleeve when the breech is open. NEVER FIRE A RIFLE IN THIS CONDITION.

FURTHER NOTE ON ROSS BOLT ACTIONS:—Each should be kept with its own rifle, to avoid accidental exchange. Any chance means of identification must be used; as they are *not* usually (as in the Lee Enfield) stamped with the serial number of the rifle.

10. General Principles of Ross Rifle Design

It is not within the intended scope of this Pamphlet to give the full operating detail of all small arm weapons but in order that the instructions in the foregoing and other paragraphs may be more easily followed, three Plates—"A", "B" and "C"—have been included from the Ross Rifle (Canadian) Supplement to S.A.T. I, Pamphlet 3, and will be found to cover the essential elements of Ross construction.



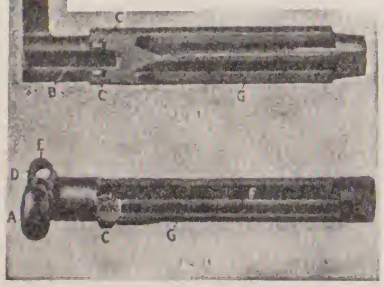
Ross, Mark III.

PLATE "A"

The SLEEVE—bottom view, Fig. 13, side view Fig. 14. *Handle* A; *Cocking Piece Slot* B; *Pawl Lugs* C; *Safety Catch Hole* D; *Safety Catch Spring Pin Hole* E; *Extractor Slot* F; *Guide Ways* G, which fit the Guides shown in Receiver at A, Fig. 6, upon which the action slides. The interior of the Sleeve has *Long* and *Short Female* Spirals corresponding with the *Male* Spirals on the Bolt.

Fig. 20

SAFETY CATCH, Fig. 20, fits into hole shown in the Bolt Sleeve at Fig. 14. When turned to the rear showing the word "Ready," the rifle can be fired. When turned to the front, it locks the Bolt Action, showing "Safe."



Figs. 13 & 14

RECEIVER

A A—Receiver Guides for Sleeve Guideways.
F—Bolt Stop Hinge Hole.
Q Q—Recesses for Bolt Heads.
S S—Resisting Shoulders.

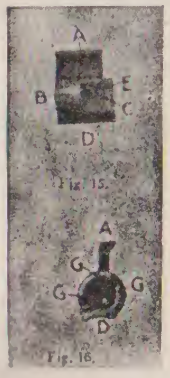


Fig. 15.

Fig. 16.

BOLT STOP—Side view, Fig. 15, End view Fig. 16. The outer edge is the *Thumb Piece* A; the *Body* B; the *Magazine Fit Groove* C; *Bolt withdrawing Groove* D; *Bolt Stop Groove* E; *Bolt Stop Retaining Pin Seats* G G G.

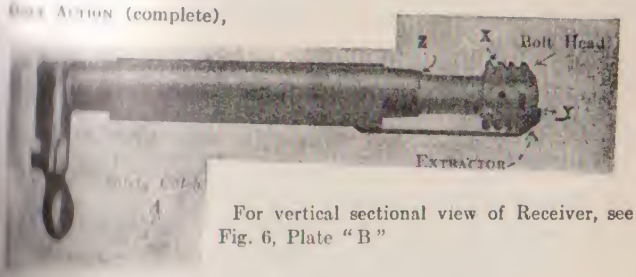
When the thumb piece A is turned down it cuts off the Magazine. With the B in this position the Bolt is drawn to the rear and the rear face of the Bolt Head stops against projecting front end of the Bolt Stop; the Rifle may then be used as a single loader.

When the thumb piece is turned up, the Bolt Stop allows the Bolt Head to be withdrawn clear of the Magazine, which then comes into action.

When the thumb piece is in the intermediate position the D mounting groove D permits the Bolt Action to be entirely withdrawn from the Receiver.

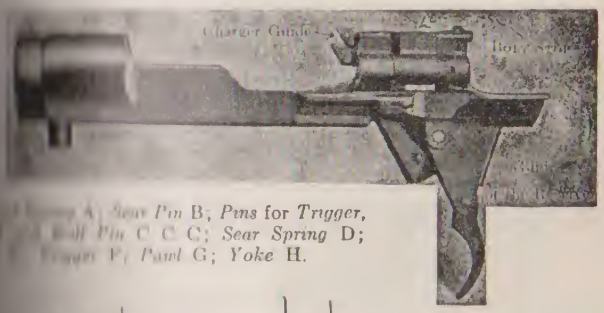
PLATE "C"

Bolt Action (complete),

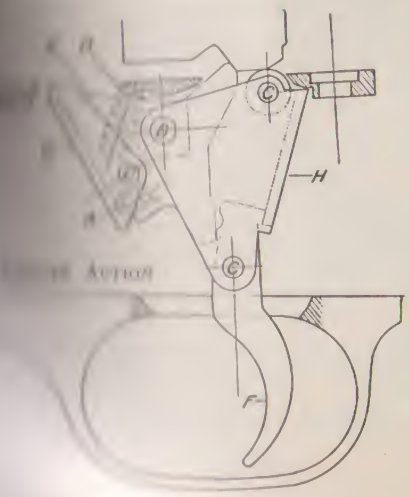


For vertical sectional view of Receiver, see Fig. 6, Plate "B"

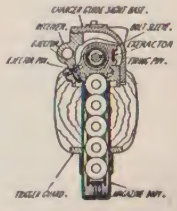
Receiver and Trigger Action,



Sear Pin B; *Pins* for *Trigger*, *Bolt Pin* C C C; *Sear Spring* D; *Trigger* F; *Pawl* G; *Yoke* H.



Trigger Action



Magazine full.
Bolt closed.

Small Arms Training, Volume I, Pamphlet No. 3.

11. Trigger Pressing

1. *Importance of trigger pressing.*—Unless trigger is pressed correctly, bad shooting will result. Good nerve control is essential. There are two distinct pressures required to fire the rifle. The first is taken as the butt comes into the shoulder to aim, the second when the aim is correct.

2. *Methods of trigger pressing.*—

(i) Cock action. Grip with right hand, forefinger outside trigger guard.

(ii) Raise butt into shoulder, at same time put first joint of forefinger on trigger.

(iii) Squeeze across small of butt in direction of thumb, until first pressure taken.

(iv) Without relaxing grip, restrain breathing and continue to squeeze until second pressure is taken.

12. How to Clean Your Rifle

1. *Materials.*

No material other than that issued from store will be used to clean the rifle.

(i) The pull-through.—Used to clean the bore, it has three loops. That nearest the weight is for wire gauze (not used without permission). The middle loop is for flannelette; the loop at the end is for use by the armourer.

Before using, run the cord through fingers to straighten it and remove grit; insert flannelette in correct loop. Drop weight through bore from breech end. Hold rifle firmly at muzzle, and do not put butt plate on stone or concrete. Pull cord, in one direction, straight through so that it does not touch muzzle of bore. If the cord rubs against the muzzle, it will make a groove known as cordwear, and the accuracy of the rifle will be spoilt.

The pull-through will be packed in the butt-trap as follows: hold the pull-through (loop end) between forefinger and thumb so that end falls two inches below third finger; roll it loosely round fingers. Slip coil off fingers and twist remainder of cord round it, leaving sufficient to allow weight to drop easily into recess in butt. Push cord into trap, loop end uppermost, and close trap.

(ii) Flannelette, oil and oil bottle.—To clean or dry the bore a piece of flannelette 4 inches by 2 inches will be used.

To oil bore, the size will be 4 inches by 1½ inches with oil rubbed in. The oil bottle is carried in butt trap.

A careless soldier will soon spoil his rifle by cord-wear.

2. *Examination of the bore.*

Hold the muzzle close to the eye and look into the bore, not through it. Draw the eye back gradually, looking for rust and fouling. Examine chamber from breech.

3. *Daily cleaning.*

The bolt, magazine and sling, (Lee-Enfield) or bolt action and sling (Ross) will be removed and put in clean place. No further stripping is allowed.

The bore will be pulled through with dry flannelette until clean, and then oiled. This is important for five days after firing.

Exterior will be cleaned with oily rag. Attention will be paid to gas escapes and crevices.

Working parts will be oiled.

In dusty climates, working parts will be kept dry. Muzzle and bore protectors may be used, but a plug for muzzle is forbidden.

4. *Cleaning before firing.*

(i) Remove oil from bore and chamber with dry flannelette.
(ii) Dry face of bolt and gas escapes.
(iii) Oil action slightly, except in dusty countries.

5. *Cleaning after firing.*—The explosion of cartridge leaves deposit in bore, which hardens and rusts unless quickly removed. This deposit is known as "fouling" and appears for several days after firing. Hot water poured through barrel helps remove fouling and should be used after firing, as follows:—

(i) Pull through with dry flannelette.
(ii) Pour 6 pints of boiling water through bore from breech, using funnel.
(iii) Dry bore with flannelette and oil it.
(iv) Clean remainder of rifle.
(v) Pull through with dry flannelette until it comes clean, and oil barrel.
(vi) Barrel will always be kept oily except as for 4 above, or for inspection.
(vii) You will receive further special instructions in regard to gauze, chamber cleaning stick, and treatment of rifle during after gas attack.

6. *Special, for Ross Rifle.*

Give extra attention to all recesses of bolt action and breech, to keep clear of grit.

13. To Load and Unload the Rifle

S.A.T. Vol. I, Pamphlet 3, Lesson 3 (or) Canadian Supplement for Ross Rifle

1. *To Load.*

(i) Push forward safety-catch, (Ross: turn to "Ready")
(ii) Pull out cut-off, (Ross: turn bolt stop up).

Open breech by pulling bolt back.

Take a charger and place it vertically in guides.

Place ball of thumb on top cartridge immediately in front of charger, hook forefinger under cut-off,—(Ross: magazine casing), force cartridges down with a firm pressure until top cartridge has engaged in magazine. If there is no cut-off, hook fingers under woodwork.

Force bolt sharply home with thumb and forefinger, turning knob fully down, and with forefinger of right hand turn safety-catch completely to rear, ensuring at the same time, by means of the remaining fingers, that bolt-lever is fully down. (Ross: force bolt sharply home and turn safety catch to "safe").

Unload.

Push safety catch forward, (Ross: turn safety catch to ready—bolt knob does not turn), draw back bolt, work it rapidly backwards and forwards to its full extent, without turning knob down, until all cartridges are removed from magazine and chamber.

Close cut-off, close breech, press trigger and apply safety-catch.

14. Additional Note on "Ross" Loading

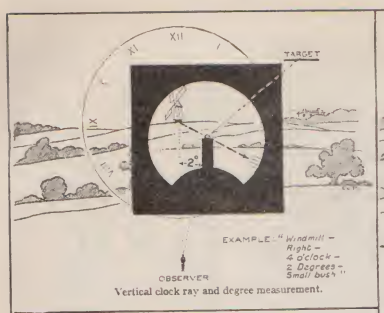
When Ross breech is really closed, the bolt sleeve handle is almost against bridge of charger-guide assembly, and forward of backsight base. If not sufficient driving force is applied in closing, the breech bolt may fail to close by about an inch, or with cocking piece still behind bolt sleeve. If trigger is pressed while rifle is only part loaded the bolt action will fly forward, completing the loading cycle and firing action will duly follow; but the main spring, having done the extra work of completing the firer's job, will probably break the round. Many claims of "miss-fires" have been due to neglect on the soldier's part to *close the breech fully*.

15. Accuracy of Aim (Sight Setting and Rules of Aiming)

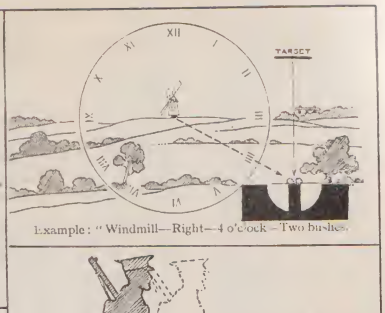
Vol. I. Pamphlet 3, Lesson 6 (or) Canadian Supplement for Ross Rifle

Sights are placed on the rifle in order to give both direction and elevation.

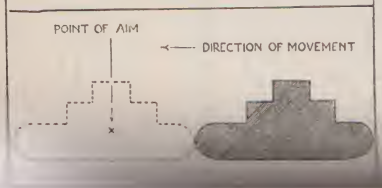
Movement of backsight.—(Lee-Enfield), with thumb of left hand push backsight to right or side of backsight. Move slide till line on it is against mark on leaf giving elevation for distance named. Backsight slide is firmly fixed. (Ross) with thumb and finger turn the milled head of the elevating screw until the required figure (on the 1,200 yard scale on *front* of the sight frame) is level with the top edge of the sight slide.

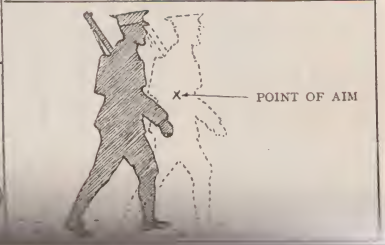


Vertical clock ray and degree measurement.



Example: "Windmill—Right—4 o'clock—Two bursts."





If allowance is not made for winds, the target may be missed. A well-trained soldier will not make this mistake. The fire in this case is ineffective and the enemy at "E" will doubtless shell the wood.

2. *The three rules of aiming.*

(i) The backsight must be kept upright.

(ii) Close the left eye. (Exceptions in special cases.)

(iii) There are two types of backsight—"U", or "open", (Lee-Enfield) and "Aperture", or "peep", (main Ross sight is latter). During the tip of the foresight at the lowest centre portion of the object desired to hit, at the same time keeping this tip (if using the "U" pattern backsight) level with the shoulders of the "U" and midway between; or (if using "Aperture") keeping the tip of foresight in the exact centre of the circular window formed by this aperture or "peep".

16. Advanced aiming instruction

Advanced instructions in aiming, the elevation table, deflection for wind or movement, service targets, etc., are fully covered in the quoted references, and will be taught in course of training.

17. Note on points of aim

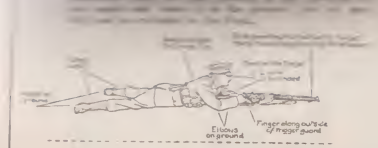
Reference is made in 2. (iii) above to "*lowest* centre portion of object". The "object" in this case must be understood as being the *aiming mark*, not necessarily the whole area of a target. A helmet just visible at ground level at 300 yds, is *both* whole target and aiming mark, and the "6 o'clock" point of aim is right; but on a 6 ft. standard target, the aiming mark is obviously the bull's eye, not the bottom of the frame. In the sketches shown (two of which also give an advance hint on "allowing off for movement", and the other two, advance examples of "indication and recognition") this should be clear. In the two examples of the rule (iii), the "object" is the whole target; in the other two, the "object" (provided the target were near enough to *select* a point of aim) would be "man" or "tank", but (say) "waist-belt" or "porthole"; i.e.: the vital or any supposedly vulnerable point.

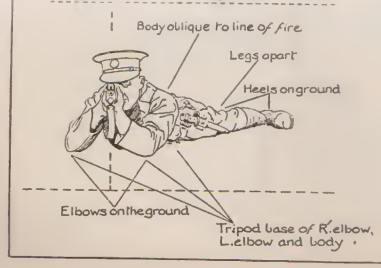
18. FIRING INSTRUCTION

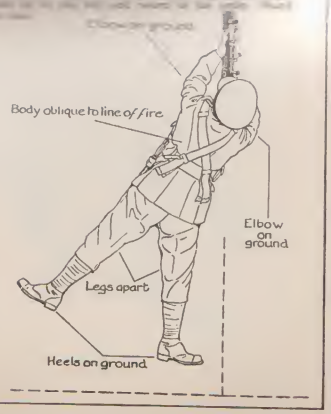
S.A.T. Volume I, Pamphlet No. 3

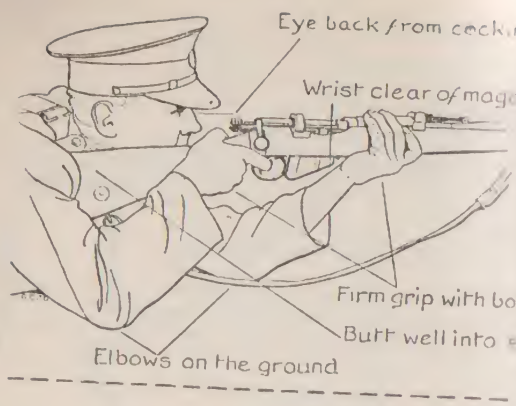
1. Firing instruction cannot be more than briefly touched upon in a few pages, as it embraces 10 complete lessons, and covers all firing practice and their attendant weapon manipulation. Its object is: *To teach the soldier to handle his rifle so that in war correct action will be instinctive.*

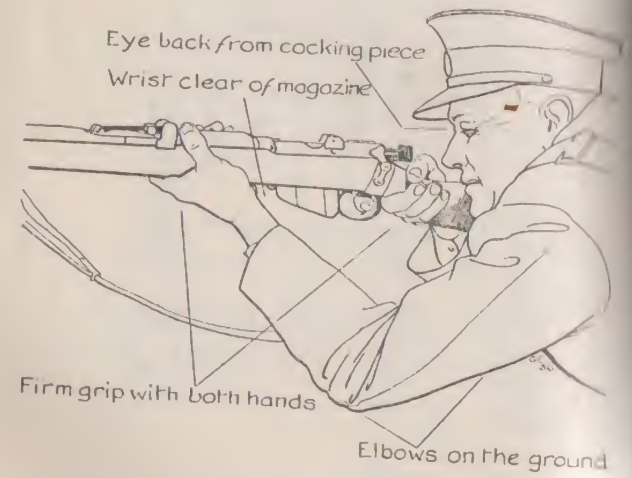
2. The several illustrations which have been used in lieu of text under this heading will serve to prepare the recruit for actual practice on the ground, and will repay careful study of the detail portrayed. Every indicated disposition of body, limbs or rifle has a definite reason for comfort and skill-at-arms, and to copy them from the start will be found of the surest and quickest means toward eventual marksmanship.


Elbows on ground
Fingers along outside of magazine

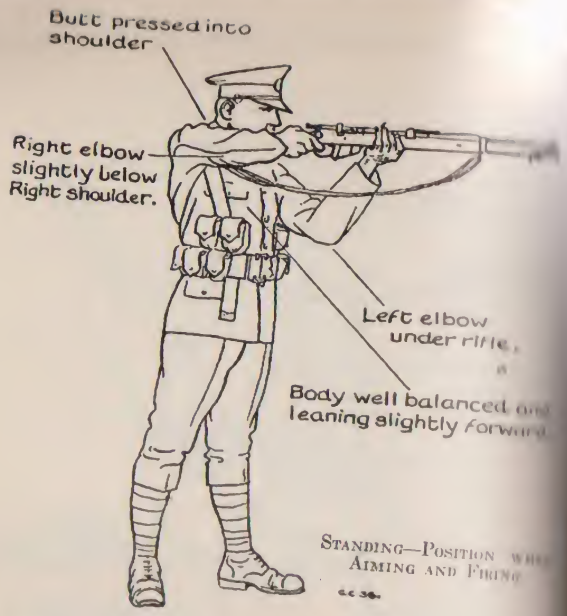

Body oblique to line of fire
Legs apart
Heels on ground
Elbows on the ground
Tripod base of R. elbow, L. elbow and body


Elbow on ground
Body oblique to line of fire
Elbow on ground
Legs apart
Heels on ground

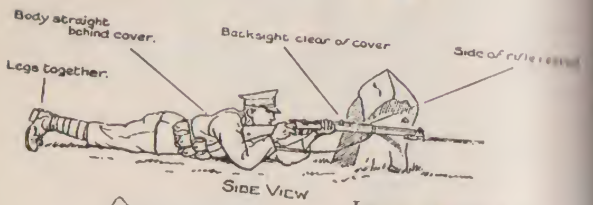

Eye back from cocking
Wrist clear of magazine
Firm grip with both
Butt well into
Elbows on the ground

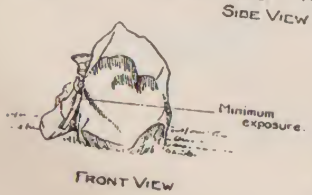

Eye back from cocking piece
Wrist clear of magazine
Firm grip with both hands
Elbows on the ground

STANDING—LOADING POSITION



STANDING—POSITION WHEN AIMING AND FIRING



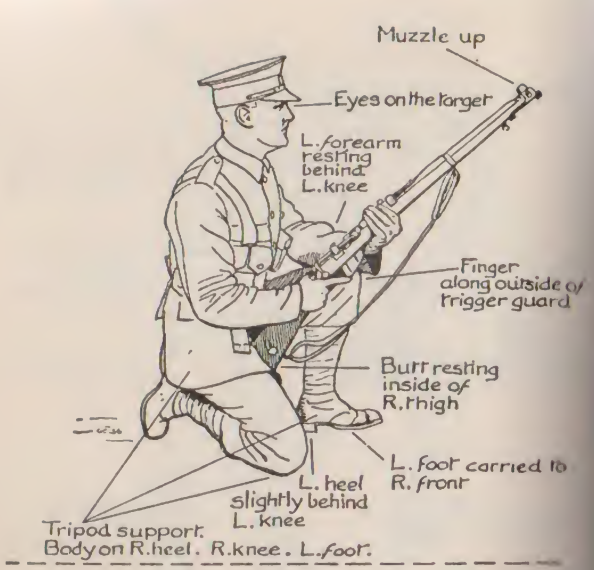


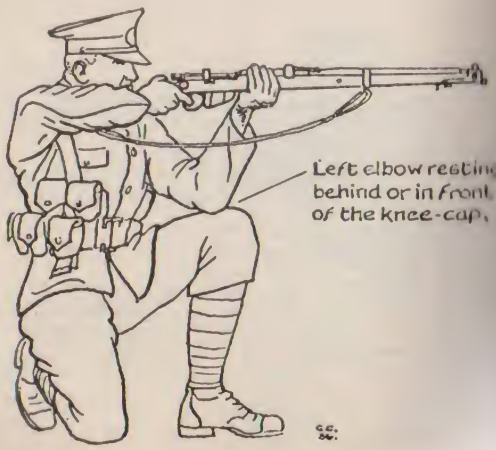
LYING—FIRING ROUND ISOLATED COVER

In firing round cover the normal position will be adopted with the side of the rifle against the cover, but, when such cover is isolated, the legs will be together behind the cover so as to avoid unnecessary exposure.


Eyes on the target
Finger along outside of trigger guard
Butt rested on thigh
Forearms rested, if convenient


Both elbows rested when possible.


Muzzle up
Eyes on the target
L. forearm resting behind L. knee
Finger along outside of trigger guard
Butt resting inside of R. thigh
L. foot carried to R. front
L. heel slightly behind L. knee
Tripod support. Body on R. heel. R. knee. L. foot.


Left elbow resting behind or in front of the knee-cap.

The *standing position* is used to fire over high cover, to take a shot during an advance, to fire at aircraft and to charge magazine.

The *sitting position* gives great steadiness in cases where the contour of the ground, and the nature of the fire task, invite the adoption of this position.

The *kneeling position* is used on service for firing from a low wall, a bank, in long grass, or in crops or scrub which would obstruct the line of sight if the lying position were adopted.

The *lying position*, the most generally used in service for firing in the field (for obvious reasons), is also employed with advantage from low continuous cover such as banks or folds in ground, and isolated cover of small size, etc.

The remainder of Firing Instruction deals with *kinds* of fire (snap-shooting, rapid, deliberate, etc.), and the *application* of this fire to various conditions,—principally the intelligent use of all available cover.

These lessons develop progressively towards the final stage in the education of the rifleman as an individual, and his introduction to the mutually dependent duties of the several individuals in a fire group—a fire unit, in short. This final stage is called—

19. Fire Discipline Training

The threefold object of Fire Discipline Training is:—

To the individual.—Rapid and accurate obedience to all orders, and a correct and intelligent use of his weapons in all circumstances.

To the fire unit.—Good team work under its leader, based on individual skill-at-arms, intelligent use of ground in the selection of fire positions, quick recognition, and the confidence which each individual has in himself, his leader and the other men of the fire unit.

20. Tests of Elementary Training in the Rifle

Vol. I Pamphlet 3, Page 68 (or) Canadian Supplement for Ross Rifle

The tests. Not all of the training on which they are based is covered in this Pamphlet, but adequate practical instruction will suffice. Tests in all cases. Although none of them are really difficult, close attention to the instruction given from day to day, and voluntary practice as time affords, will ensure that a man passes the tests with a safe margin of proficiency.

Rifle and ammunition.—Each man will be asked four questions.

Three out of four correct.

Distance of marks.—Four distances; not over 400 yds. difference between.

Position varied, i.e. lying and kneeling, etc.

Time correct. Each within three seconds, (Ross, 5 seconds).

3. Aiming.—From aiming rests.

(*a*) Small target 200 yards (two aims).

(*b*) Fig. 3 silhouette 200 yards (two aims).

Standard.—Three aims correct.

4. *Trigger pressing.*—Tested by aiming disc. Accuracy, and correct trigger pressure essential. Dummies will not be used.

Standard.—Three correct trigger pressures out of four.

5. *Aiming off.*—Carried out with rifles and aiming rests, using small target and Fig. 2 silhouette up to 300 yards. Men will aim rifles at different points of aim on small target, or target widths of Fig. 2 silhouette.

Standard.—Three correct aims out of four.

6. *Snapshooting.*—The man to bring rifle from loading position to shoulder, to align sights on an aiming disc held to the eye, to press trigger and instantly reload in the shoulder. Time allowed from the order "Fire" until the trigger is pressed will be 4 seconds. Position lying. Dummies will not be used.

Standard.—Three out of four aims to be correct.

7. *Rapid firing.*—Man (rifle loaded 5 rounds) on command "Ready" comes into aim, and on order "Fire" will fire 10 rounds at a target, pouch buttoned up when each charger withdrawn. On completion to load with fresh charger, apply safety catch and button pouch. To be completed in one minute from order "Fire." Aim checked with corrector. (Mk. III Ross: 75 seconds; Mk II Ross: 90 seconds).

Standard.—Eight shots correct.

8. Firing positions behind cover.—Bayonets fixed. Inspection of positions behind suitable cover. Serious faults will fail.

9. Recognition.—(In open whenever possible.) Men tested should be at aiming rest. Instructor will describe suitable target. Aim rifles at target recognized from description. Four targets indicated for every test, and each method of indication (see Pamphlet No. 2) will be employed.

Standard.—Three out of four points be recognized.

General Note on T.O.E.T.:—The various references in the following to "shots," "loading," "firing," etc., imply either the use of ball or, in certain cases, an empty rifle. Live ball ammunition is not used in T.O.E.T.

CHAPTER EIGHT

THE THEORY OF SMALL ARMS FIRE

S.A.T. Vol. I, Pamphlet 1, Weapon Training

1. Importance

In order to obtain the full fire effect from the weapons with which [illegible] are armed, it is necessary for all ranks to have a working knowledge [illegible] theory of small arms fire.

2. Elementary Theory (Rifle)

[illegible] Mark VII ammunition, cartridge and bullet.—

[illegible] cartridge case is of solid drawn brass and has a rim at base by [illegible] cartridge is positioned in chamber and extracted.

[illegible] It contains propellant charge.

[illegible] Sealing of chamber is effected by expansion of walls of case on firing.

[illegible] It carries the means of ignition.

[illegible] bullet is pointed and has a lead core enclosed in a cupro-nickel [illegible]. The advantage of elongated bullet is that it has greater weight [illegible] relation to surface directly opposed to the air and is, therefore, [illegible] to overcome resistance of air; thus its velocity is assisted and [illegible] range and striking power obtained.

[illegible] A barrel is said to be rifled when it has spiral grooves cut [illegible] (see Fig. 1).

Cross section, magnified 6 times, of rifling of bore: Lee-Enfield barrel.

FIG. 1.

4. When a weapon is fired, certain factors at once begin to act on the bullet.

(i) Before the bullet leaves the barrel.

(*a*) Force of explosion.—When round is fired, the gases formed push the bullet forward through the bore to the muzzle, and out into the air. With Mark VII ammunition the velocity with which the bullet leaves the muzzle is 2,440 feet a second.

(*b*) Rifling.—When charge is fired, bullet is forced against grooves along barrel and, consequently, when it leaves muzzle it has acquired a spinning motion. This tends to keep nose foremost and to ensure steadiness in flight, with resultant accuracy. This spinning also enables an elongated bullet to be used.

(*c*) Movement due to recoil.—The explosion, together with bullet forcing its way through barrel, sets up a vibratory movement which may result in a difference between the axis of the bore before firing and the line of departure of the bullet. This difference expressed as an angle is known as "jump" and is compensated for by adjustment of foresight before rifle leaves factory.

(*d*) Oily barrel.—If shots are fired with an oily barrel, abnormal vibration and consequently erratic shooting will occur until the oil is burnt up.

(*e*) Oily cartridge.—Should the chamber or cartridge be oily or wet, extra back-pressure will be developed on the bolt head, breech block or lock owing to lack of friction between the case and the chamber. This will affect vibration and erratic shooting will result.

(*f*) Stocking up of the rifle, i.e. the fitting of the fore-end to the barrel and body.—This is most carefully done at the factory.

(*g*) Effect of firing with the bayonet fixed.—The weight of the bayonet may affect the jump and the shooting of the rifle.

Normally with Mark VII ammunition the jump is upwards, no allowance has to be made, but no two rifles shoot exactly alike. As a rough guide, a bullet fired from the average rifle with a bayonet fixed at 300 yards range strikes the target about 1 foot above the point which it would have struck had the bayonet not been fixed.

In every case the man must ascertain the shooting of his rifle.

(*h*) Resting the rifle.—This may affect the jump. The effect will be reduced to a minimum when the rifle is rested at the point of balance.

(ii) After the bullet leaves the barrel.

(*a*) Resistance of the air.—This causes the velocity of the bullet to decrease rapidly and allows it to travel only about 600 yards in the first second, about 400 yards in the second second, and about 300 yards in the third second.

(*b*) Gravity.—This acts on the bullet immediately it leaves the muzzle, drawing it downwards with increasing speed.

These two factors cause the bullet to travel in a curved path, the fall of the bullet becoming steeper as the range increases.

3. Definitions (See Figure 2)

Axis of barrel is an imaginary line following centre of bore from breech to muzzle.

Line of departure is the direction bullet takes on leaving muzzle.

The line of fire is the direction of the target from the muzzle of a weapon.

Line of sight is a straight line from the firer's eye, through the sights, to the point aimed at.

Trajectory is the curved path taken by a bullet during its flight.

Culminating point is the greatest height above the line of sight which the bullet rises in its flight; this occurs a little beyond half the range which the bullet travels.

Angle of descent is the angle which the tangent to the trajectory makes with the line of sight at point of impact.

(Not to scale) to illustrate the basic definition of "Theory of Small Arms Fire".

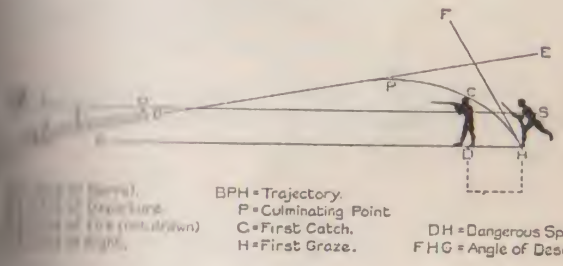


FIG. 2.

Bullets which rebound after striking the ground or any object and continue their flight are said to ricochet. Ricochets occur from any surface, but are less likely from soft ground than from hard surfaces; bullets ricochet freely from water, and from surfaces that do not slow the bullet abruptly or deviate considerably to right or left of the original course.

First catch is the point where the bullet has descended sufficiently to hit the head or body of the target.

First graze is the point where the bullet, if not interfered with, would first touch the ground.

11. The dangerous space for any particular range is the distance between the first catch and the first graze. The extent of the dangerous space depends on:—

The dangerous space:—

decreases:

As the range increases, owing to the steeper angle of descent of the bullet at the longer ranges (*see* Fig. 3, and Range Table, Section 7).

increases:

(*a*) The nearer the weapon is to the ground (Fig. 4).
(*b*) The higher the object fired at (Fig. 5).
(*c*) The flatter the trajectory (Fig. 6).
(*d*) The nearer the slope of the ground conforms to the angle of descent of the bullet (Fig. 7).

(*a*) *The range.*

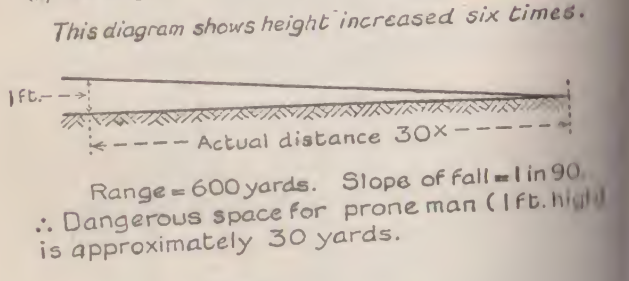


FIG. 3.

(*b*) *The height of the weapon above the ground level.*

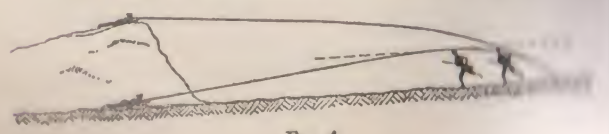


FIG. 4.

(c) The height of the object fired at

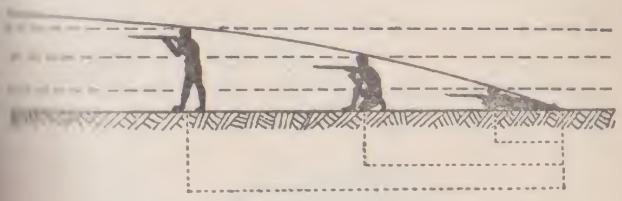


Fig. 5.

(d) The flatness of the trajectory

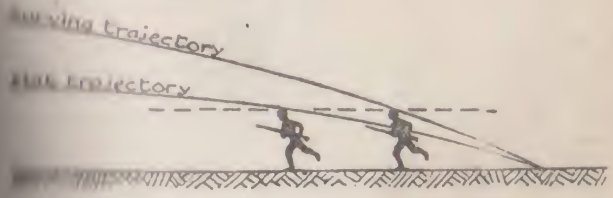


Fig. 6.

(e) The configuration of the ground

Fig. 7.

4. Elevation

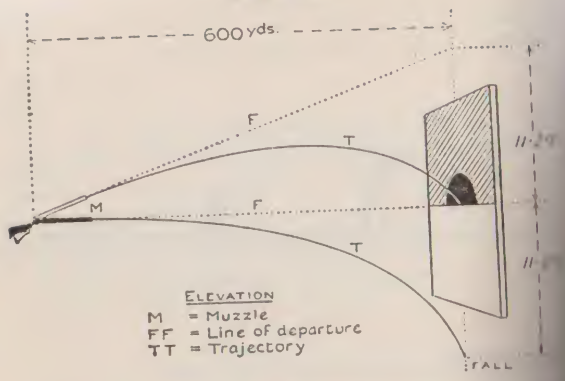


FIG. 8.

1. *Elevation.*—In order to allow for the fall of the bullet, it is [illegible] to direct the line of departure as much above the object to be [illegible] the bullet will fall below it if the axis of the barrel is pointed [illegible] target. This raising of the barrel to allow for the curve of the [illegible] is termed giving elevation (Fig. 8).

As the target must be kept in view, the weapon is provided with [illegible] which permit the firer to give the elevation required without losing [illegible] of the mark (*see* Section 7).

2. *Sighting of small arms weapons.*—In sighting, an average elevation [illegible] each range has been adopted. In addition, each weapon is [illegible] tested at short range before issue and is sighted to hit the point [illegible] at, within certain close limits. There are, however, in each [illegible] small manufacturing variations. These inequalities produce [illegible] duality in each weapon which shows itself in a slight variation [illegible] sighting elevation required; it is, therefore, necessary for each [illegible] study the shooting peculiarities of the weapon with which he [illegible]

3. *Sight graduations.*—Each man, in studying the shooting of his [illegible] weapon, should find out any error in sighting that may exist [illegible] graduations up to 600 yards and set his sights accordingly. At [illegible] ranges the graduations on the backsight should be regarded as [illegible] possible guide under all conditions.

5. Effect of Wind

1. The effect of a side wind on the path of the bullet is [illegible] at the longer ranges.

2. Head and rear winds.—Up to 1,500 yards no allowance [illegible]

3. For strong winds at 1,500 yards add 50 yards for a head [illegible]

4. For strong winds at 2,000 yards deduct 50 yards for a [illegible]

6. Trajectory Table

Height of trajectory (in feet) above the line of sight of the Rifle No. 1, Mark III, S.M.L.E. or Rifle, firing S.A.A., ·303-inch, Mark VII, M.V. 2440 F.S.

Range (yards)	200	300	400	500	600	700	800	900	1000	1100	1200
	0·2										
	1·6	1·4									
	3·6	2·9	2·0								
	6·2	4·4	4·1	2·6							
	9·9	6·2	6·6	5·8	3·6						
	9·3	8·3	9·4	9·4	7·9	4·8					
	7·9	10·7	12·6	13·3	12·6	10·3	6·2				
	5·7	13·4	16·2	17·8	18·0	16·5	13·2	7·8			
	11·7	16·5	20·3	22·9	24·1	23·7	21·3	17·3	10·5		
	14·0	19·9	24·8	28·5	30·9	31·7	30·7	27·5	21·9	12·5	

7. Range Table

For Rifles Firing S.A.A., ·303-inch, Mark VII, with a Muzzle Velocity of 2440 F.S.

Range (yards)	Angle of tangent elevation	Angle of descent
	deg. min.	deg. min.
	0 7	0 9
	0 11	0 15
	0 16	0 22
	0 22	0 30
	0 28	0 40
	0 35	0 52
	0 43	1 7
	0 52	1 25
	1 2	1 46

For longer ranges and those distances, *see* "·303-inch Vickers machine gun range tables."

CHAPTER NINE

ANNUAL RANGE COURSE (RIFLE)

S.A.T. Vol. I, Pamphlet 1, and Small Arms Training Courses, C.A.F. and N.P.A.M., 1940

1. Course to be Fired

1. The ·303" course to be fired at M.T.C's is shown opposite.

2. Range Discipline

1. To avoid delay, a simple system of issuing ammunition and [illegible] that details next to fire are ready will be devised by units in accordance with the following general instructions:—

(i) There should be (as nearly as the available qualified personnel will permit) an assistant instructor for each firer (if entitled).

(ii) A N.C.O. should be responsible for the issue of ammunition and collection of empty cases and live rounds.

(iii) In grouping practices, two details should fire and then [illegible] to the targets to see their groups measured and note the [illegible] of their M.P.I.(*)

(iv) In snapshooting practices, the timed exposures of the targets [illegible] be controlled by the officer on butt duty. The exposure [illegible] reckoned from the time when the target is in position [illegible] stationary to the moment when it is again moved for [illegible].

In rapid practices, the time will normally be regulated [illegible] the butts. In these cases the actual fire order by the [illegible] superintending at the firing point will be in anticipation [illegible] targets appearing. This officer will inform the officer in the butts when the detail is ready. Where the normal procedure [illegible] be adopted, the targets will be exposed before the practice [illegible] and the timing carried out at the firing point.

(v) Occasional shots.—Occasional shots to verify elevation, [illegible] accuracy of the weapon, etc., may sometimes be fired by the officer or N.C.O., with the senior officer's permission. They will not be fired during practices of the classification or qualifying tests. Notification of their beginning and end will be given to the officer in the butts. The target in use will be lowered, [illegible] checked and a clean one raised for the occasional shots. When they are completed, it will be lowered and checked and the [illegible] target raised for the firer to complete the rounds.

Notes:— (*) " M.P.I."—Mean Point of Impact.

							A recruit may not be zeroed in his [illegible] before he begins to shoot.
3.	Grouping	Small 200/30 (9) (36)	30	5	30	Lying (a) " "	SCORING.—1-inch group—25 points 2-inch group—20 points 3-inch group—15 points 5 hits, 4 within 3-inch ring—10 points.
4.	Grouping	Small 200/30 (9) (36)	30	5	25	Lying (b) " "	
4.	Slow	Small 200/30 (9)	30	5	20	Lying (b)... " "	SCORING.—Bull—4; Inner—3; Magpie—2; Outer—1.
5.	Rapid	Small 200/30 (9)	30	5	15	Lying (a). The firer will be standing at the order until the target appears, or until the order to fire is given. Rifle unloaded; ammunition in the pouch, which will be buttoned; safety catch back and sights adjusted. Time limit:—Recruits, 60 secs.; Trained soldiers, 45 secs.	SCORING.—Bull and Inner—3; Magpie—2; Outer—1.
6.	Snapshooting	Fig. No. 3 Disappearing man (6)	30	5	10	Lying (b). Rifle loaded, sights adjusted, and safety catch forward. Butt and nose cap to be touching the ground before each exposure. Exposure, 5 secs. for each shot. NOTE.—Where facilities do not exist for raising and lowering the targets, practices 5 and 6 may be carried out by word of command with the targets exposed.	SCORING.—2 points for each hit. INSTRUCTIONAL STANDARD FOR PART IV 1st Class.....70 points or more 2nd Class.....45 " " 3rd Class.....25 " " Failed.....Under 25 points.
		Totals... ...	...	30	95		

3. Special Conditions

1. Allowances and Penalties:—

(i) The use of the windgauge(**) and sling is prohibited.

(ii) No sighting shots are allowed, unless provided for in the practice.

(iii) The fine adjustment (if on rifle) may be used in any practice.

(iv) Allowance for jams and missfires:—

(*a*) If a jam or stoppage, due to breakage or a defect in mechanism, occurs, and is not caused by any fault of the firer, the time allowed for the practice will be increased to the extent due to the delay hereby resulting. Should a jam or stoppage occur in a rapid practice through a defect which cannot be quickly rectified, the whole practice will be repeated.

(*b*) In the event of missfires, provided that the superintending officer is satisfied that the cap of each cartridge has been struck, extra rounds will be allowed equal to the number of missfires which occur in the practice concerned, a proportionate part of the time allowed for the whole practice being given for each extra round.

(v) Forfeiture of rounds.—Omission to fire the rounds allotted or failure to fire during an exposure will entail forfeiture of the rounds which should have been fired, and misses will be recorded for them.

(vi) For every shot fired after the order or signal to cease fire has been given, the value of the highest hit obtainable by a single shot will be deducted.

2. The following is the interpretation of terms used in the details of range practices:—

(*a*) With rifle rested.—Hand and forearm supported against the rest. The rest (usually sandbags) may be adjusted to suit the firer.

(*b*) In the open.—No support of any kind is allowed for the weapon, forearm or wrist.

4. Safety

1. *Safety Precautions (All Ranges).*

(i) Firing will not take place until the danger flags are hoisted, look-out men posted according to the by-laws and standing orders.

(ii) A red danger flag will be hoisted at the butts as a warning to cease fire. The flag will be kept up until the whole of the firing party is under cover. No one will leave the butts until the completion of fire has been notified from the firing point. When cessation of fire is required, the superintending officer at the firing point will normally give the order.

(iii) A red flag will be hoisted at the firing point when no firing is taking place. It will always be hoisted when the danger flag is flying at the butts.

(**) (except for centering sight plate on "Ross" Screw-Elevating Rear

(j) Weapons will be pointed toward the butts during inspection and when loading or unloading takes place.

(k) No one, except the firers, the instructors and the officers on duty, will be allowed on the firing point.

(l) If firing is suspended during a practice, or whenever the danger flag is hoisted at the butts, safety catches will be applied, rifles will be laid on their side, and firers will stand up.

(m) After firing, live rounds will be separated from empty cases and collected, under the orders of the superintending officer.

(n) An officer will inspect all weapons and equipment before they are removed from the firing point, to ensure that they are unloaded and that the men are not in possession of ammunition. A further inspection will take place before the company or party leaves the range.

(o) No weapon will be loaded without orders from the superintending officer.

(p) Dummy cartridges will not be taken on the range, except for use in stoppage practices. In this case the cartridges will be taken to and from the range under the orders of the company, etc., commander.

(q) Indiscriminate snapping is forbidden.

(2) *Additional precautions for miniature and 30-yard ranges.*—

(a) *Miniature ranges.*—When it is necessary to examine targets, rifles will be unloaded and laid on the firing point with the breech open, and the red flag will be raised before anyone goes to the target.

(b) *30-yard ranges.*—

(i) No more than six rifles or four machine guns will be fired at the same time on the standard 30-yard range.

(ii) During the firing of machine-gun practices, the superintending officer may make special arrangements to call those waiting to fire up to a position from which they can hear the instruction and observe, but even then they must be at least five yards in rear of the firer.

(iii) No target will be placed within four feet of the sides of the bullet catcher.

(iv) Representative targets and pistol targets will be placed at the bottom of the bullet catcher.

(v) Landscape targets will be placed so that the skyscreen is at the bottom of the bullet catcher and the picture below it.

(vi) Anti-aircraft targets, ·22-inch, will be placed so that the line of fire is directed into the bullet catcher.

(vii) Group plates, moving targets and anti-aircraft targets, other than those approved ·22-inch, are not allowed.

(viii) Field practices involving the advance of the firer or the target will not be carried out.

CHAPTER TEN

ANTI-AIRCRAFT

S.A.T. Vol. I, Pamphlet No. 6, Anti-Aircraft, 1937.

LESSON 1.

1. Principles of Small Arms A.A. Defence

1. The following are the main principles to be observed:—

(i) There must be a system whereby warning of the approach of hostile aircraft is conveyed to the troops (*see* para. 6, General S.A.T.I., Pamphlet No. 6).

(ii) The maximum fire of all available small arms weapons must immediately be brought to bear on the attacking aircraft, provided that they are within range. It is only by adopting an offensive attitude that morale can be maintained and that low-flying attacks by aircraft will be made so costly as to become unsound policy for the enemy.

(iii) Subject to (ii), above, units of all arms will present to the attacking aircraft the least favourable target, according to the situation in which they find themselves.

(iv) When movement is stopped, it must be continued at the earliest moment.

(v) When troops are on the move, rifle fire will generally be ineffective to produce and, therefore, more suitable.

(vi) In bivouacs, billets, or when otherwise halted, light machine guns, suitably sited and concealed, should form the main small arms defence.

(vii) To be effective, fire must be controlled.

(viii) Speed in opening fire is essential. This requires strict fire discipline training.

(ix) Fire unit commanders must know beforehand whether they are to open fire on their own initiative or not.

2. Protection

1. Every commander is responsible for the protection of his command against surprise, and for concealing his dispositions from enemy ground troops and aircraft.

2. **On the move.**—In cases of troops on the march, the fleeting target precludes, as a normal procedure, the possibility of advance action, and, except in small columns, large spaces between units and vehicles. Columns must, therefore, generally be protected by light machine guns piqueting the area and particularly the defiles through which the troops are moving. Other means of protection are light machine guns mounted on M.T. vehicles moving within the column or on the flanks.

The dispersion of small infantry parties throughout a column on the [illegible] for protective duties should be resorted to only in most exceptional [illegible] or when tactical considerations are of no account.

All units must protect themselves with the weapons at their disposal. The rifle will normally be used, but light machine guns should be brought [illegible] if time permits; it is essential that as great a volume of fire [illegible] should be speedily produced. Normally, therefore, all available [illegible] will be fired.

[illegible] there will not be time to issue orders for opening fire through [illegible] chain of command, responsibility must be delegated. The fire [illegible] will be the platoon. Men will march with magazines charged with [illegible] and sights set at 500 yards.

When halted.—The fire of light machine guns is the most economical [illegible] of protection. It should be organized in the form of area defence, [illegible] being sited not less than 500 yards or more than 800 yards [illegible] the corners of a series of equilateral triangles, disposed so as [illegible] the area protected. It will sometimes be of advantage to site [illegible] pairs in order to produce a greater volume of fire in the more [illegible] lines of approach of enemy aircraft. The extent to which this [illegible] must depend on the total number of guns available in pro- [illegible] to the area to be defended. When troops are concealed, orders [illegible] issued whether light machine guns are to be posted and are to [illegible] against hostile aircraft or not; the opening of fire may betray [illegible] hostile observer the fact that the area is occupied. During short [illegible] anti-aircraft light machine guns will be disposed under company [illegible] arrangements. During long halts or in camp, billets or bivouacs the [illegible] defence will be co-ordinated under brigade and battalion [illegible]

3. Considerations in Training

[illegible] to the speed of modern aircraft it is impracticable to provide [illegible] fire with any form of anti-aircraft sight or other mechanical [illegible] like the rifle or the light machine gun. Extreme accuracy of [illegible] therefore, give way to quick retaliation and volume. Estimation [illegible] can be limited to a knowledge of when fire can usefully be opened. [illegible] therefore, will primarily be concentrated on obtaining:—

[illegible] in opening fire. The time available will depend on early [illegible] of

[illegible] fire discipline.

[illegible] volume of controlled fire.

[illegible] are the two main types of anti-aircraft target to be [illegible]

[illegible] attacker.

[illegible] presents the more urgent problem and will allow of prac- [illegible] It consists of an aeroplane diving to the attack or [illegible] after it. On the march, the rifle is likely to be the most [illegible] of retaliation against this type of attack, and men must

be instructed how to shoot and turn quickly. Light machine guns should also be brought into action, if time permits.

As regards (ii), this type is likely to provide opportunities to both rifle and light machine gun firers. Since no mechanical aid is practicable, the firers will have no assistance other than a "lead" calculated as being 30 degrees when the target is crossing at right angles to the line of fire. They must receive instruction as to how they can instinctively recognize the lead in the sky. The swing of the weapon is of the utmost importance and it must be impressed on all troops that the movement of the rifle or light machine gun must not be checked at the moment of pressing the trigger.

3. Riflemen and light machine gunners will receive training on identification lines.

LESSON 2.

DIRECT ATTACKER (RIFLE)

4. Instructor's Notes

Stores.—

Diagrams of diving and climbing aeroplanes fixed along the top of the four walls of the barrack room or place of parade, so as to show the 25 degrees safety angle.

Squad in two ranks, 10 yards or less from the diagrams.

Order: "Standing"—"Charge magazines"—"500"—"Rest."

1. (i) Explain that, owing to the high speed of modern aircraft it is essential that fire should be delivered quickly and with reasonable accuracy. This lesson deals with the method of firing at diving and climbing aeroplanes. There are two rules of aiming:

(*a*) Sights set at 500.

(*b*) Align the sights on the centre of the aeroplane.

NOTE.—As a point in "recognition", the silhouette German 'plane in the corner is a Junkers Ju 86 K twin-motor bomber. The only example in any Air Force with Diesel motors, which have a deeper and more powerful note compared with ordinary petrol aircraft engines. The typical Junkers wing, tapered equally on leading and trailing edges, has the characteristic Junkers "double-wing" trailing flap. The twin fins and rudders are set on the fuselage. The nose has a prominent circular bump on top of a squarely rectangular shape.

(d) Demonstrate from the standing position:—

Aircraft action.
Aircraft front.
Firing.
Stop.
Charge magazines (full capacity).

2. Explain and demonstrate with squad imitating:—

(a) **Aircraft action.**—On the order "Aircraft action" adopt the standing load position with the muzzle of the rifle as vertical as possible and load, leaving the safety catch forward.

(b) **Safety angle.**—The rifle when held in the firing position should be at an angle of not less than 25 degrees with the horizontal. A useful guide is that the upper part of the left arm must be parallel with the ground (*see* Fig. 2).

(c) **Quick aiming and turning.**—

Explain that, owing to aircraft being within range for such a short period, it is essential that all movements, such as coming into the aiming position and changing direction, should be carried out with the utmost speed. A standard of firing the first shot within two seconds should be aimed at.

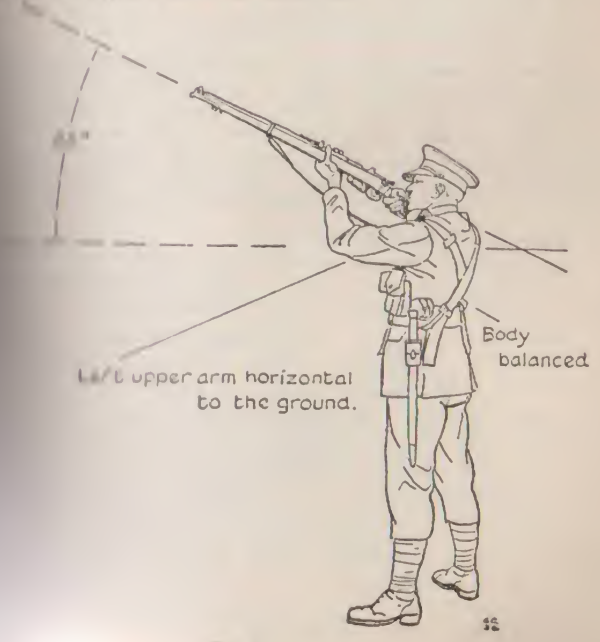


FIG. 2.

(ii) Explain and demonstrate with detail:—

On the order "Aircraft front," raise the rifle quickly to the aiming position, take first pressure and aim. On a new direction being ordered, turn quickly, pivoting on the right leg, in the direction named and aim. Finally, return to the loading position.

4. **Firing.**—

Explain that fire against aircraft will always be at the rapid rate. Before a new target or direction is ordered, the command "Stop" will be given. If a new direction is immediately ordered, the man, without applying the safety catch, will turn quickly and on the command "Rapid fire," continue to fire as before. When the safety angle cannot be maintained, men will adopt the loading position and load if necessary.

(*Lesson* 3 *not shown*)

5. Apparatus and Accessories

1. The following equipment is required in connection with anti-aircraft training:—

(i) Silhouette model diagrams of aircraft.
(ii) 12-degree lead measurements.
(iii) Model aeroplane with pole and stand.

2. **Silhouette model diagrams.**—Silhouette model diagrams should be affixed to walls of barrack rooms or the places of parade selected for anti-aircraft training. They should be placed at a height which will permit the man under instruction to aim and fire at them while maintaining the safety angle of 25 degrees. The diagrams should be at approximately the same distance from the firer. Diagrams should be mounted on plywood to give a white surround of approximately 9 inches.

3. **12-degree lead measurements.**—

(i) The lateral distance which 12 degrees subtends at the following distances should be marked on one of the outside walls in the range as follows (*see* Fig. 8 of S.A.T.I., Pamph. 6).

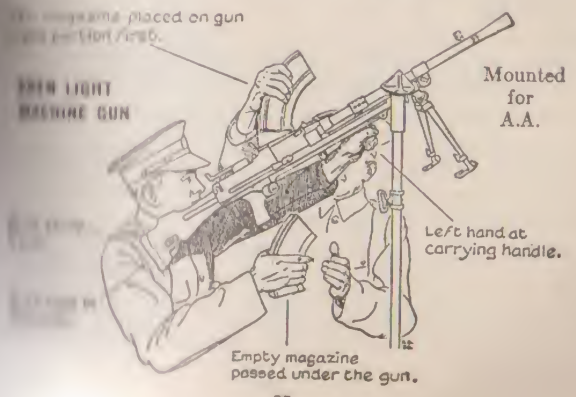
Range	Lateral distance
10 yards	6 ft. 8 in.
30 yards	19 ft. 3 in.

4. **Model aeroplane with pole and stand.**—General description.

(i) The apparatus consists of a pole, 15 feet high, on which is mounted a small-scale model of an aeroplane and a movable arm carrying a wire rectangle which can be placed so as to appear to be flying in the line of flight of the aeroplane, and at a suitable distance ahead of it to represent the distance through which the aeroplane would travel during the flight of a bullet fired at it. The arm can be lengthened to give 12 degrees at ten yards by means of a bar which can be slipped over the existing movable arm and held in place by two clips (*see* Fig. 11). This small alteration

MODEL AEROPLANE WITH POLE AND STAND

FIG. 11.



easily carried out by unit armourers. For crossing aeroplanes the wire rectangle should be slightly above or below the horizontal so as to appear to coincide with the line of flight of the aeroplane as shown by the line of flight rod.

(ii) The pole is held vertically in a wooden stand, or in a hole in a socket in the ground.

(iii) The pole is made of stout bamboo or 2-in. by 2-in. scantling of sufficient length so that the nose of the aeroplane, when in the horizontal position, is 15 feet above ground level.

(iv) The aeroplane model is fixed on a spike on top of the pole. This spike is connected to the pole through an adjustable two-way knuckle joint fitted with bolts and wing nuts.

(v) The spike can be inclined at any angle within wide limits so that the aeroplane may be slewed round on the spike so as to appear to be flying towards or away from the firer at any desired angle. The movable arm and rectangle, when in use, must always be at right angles to the firer's line of sight.

(vi) The arm which carries the rectangle is pivoted on the pole so that it can be dropped while a rifle is being laid on the target and then raised so that the "lead" may be checked by comparison with the centre of the rectangle.

(vii) When in use, the foot of the pole should be nine yards distant from the centre of the rifle rest or tripod mounting, or an equivalent distance, about 10 yards from the firer's eye when the weapon is in the shoulder.

LESSON 4.

THE LEAD (RIFLE)

6. Instructor's Notes

It may be convenient, on occasions, to combine Lessons 4 and 5 in one lesson.

Stores.—

Model aeroplane with pole and stand fitted with movable arms and line-of-flight rod (see Fig. 11). *Set up with a sky background.*

12 degrees displayed in barracks at 10 yards, 30 yards and 100 yards.

The model aeroplane will be set up as a direct crossing plane with rectangle a 12 degrees lead in front. Distance from the centre of stand to the centre of the aiming rest—nine yards.

Place rifles on the aiming rests.

1. Explain that it was necessary to aim off a "lead" in front of targets on the ground and that the same principle will apply to and firing at aircraft crossing the front. A lead of 12 degrees must therefore always be maintained in front of all crossing targets, whatever direction, except the "direct attacker." The two rules of aiming at aeroplanes are:—

(i) Sights set at 500 yards.

(ii) Direct the rifle the required lead in front of the aeroplane and in the direction of its flight. Maintain the lead by swinging with the aeroplane and fire without checking the swing.

3. (i) Question squad on the method of measuring degrees taught in application of fire and explain that each man must measure for himself what part of his left hand when at arm's length will give 12 degrees from the nose of the aeroplane to the centre of the rectangle (*see* Fig. 3). The parts of the hand which give this measurement at ten yards will also give 12 degrees at any range.

(ii) Practise squad at ten yards measuring the lead in the aircraft action position with the left arm extended.

4. Lower the rectangle. Practise squad aiming off 12 degrees with and without the aid of the hand. Check by the rectangle, which will always [illegible] at right angles to the firer irrespective of the direction of flight [illegible] plane.

5. (i) Explain that all ranks should practise the lead against a sky background and on clouds until the measurement becomes instinctive.

(ii) Practise squad at distances of 30 yards and 100 yards which have been previously measured and marked out and provide a sky background.

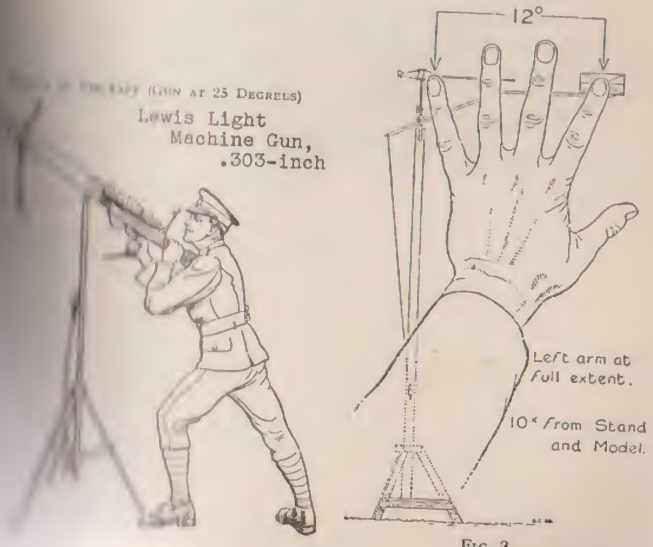


FIG. 3.

LESSON 5

CROSSING AEROPLANE (RIFLE)

7. Instructor's Notes

Stores.—

Model aeroplane with pole.—The model to be carried by a fatigue man at a brisk pace on the front and flanks of the squad at not more than six yards' distance.

Squad in two ranks.

Order: "Standing"—"Charge magazines," "500," "Rest".

1. i. Explain that the lesson teaches the use of the "lead" at crossing aeroplanes. Question squad on the two rules of aiming and emphasize the continuance of the swing at the moment of firing. The feet may be moved to suit the swing, but the direction must not be changed.

   ii. Explain and demonstrate with squad standing behind the instructor watching the swing of the rifle—"Aircraft action"—"Aircraft fire"—"Rapid fire"—"Stop"—"Charge magazines."

2. **Quickening.—**

   i. Explain that, on the order "Aircraft action"—"Aircraft right" ("about," etc.), men will turn quickly in the direction ordered, aim the rifle the "lead" in front of the aeroplane, take the first pressure and swing along the line of flight.

   ii. Practise changing direction, quick aiming and swing. Commands: "Aircraft action"—"Aircraft front"—"Rest." Order fatigue man to carry the model in a new direction, then order "Aircraft action"—"Aircraft right" (or according to new direction).

3. Practise squad (in two ranks not more than six yards from the model) by word of command.

CHAPTER ELEVEN

THE BAYONET

Small Arms Training Vol. I, Pamphlet No. 12; and as noted under Section 4.

1. General

No other weapon is like the bayonet, or approaches its role in battle. It is the weapon of attack for hand-to-hand and night fighting; full effect is gained only by the collective efforts of platoons or sections. The use of the bayonet, or the threat of it, will often enable infantry to drive the enemy from his position or cause him to surrender. Under certain conditions, the use of the bullet must not be forgotten. (i.e.: *Firing from the Hip*). See Section 4.

In an infantry assault, the greatest moral effect will be attained by steady advance in formation. But, once hand-to-hand fighting begins, it usually [illegible] that any regular formation can be maintained. Such conditions often occur during the looser fighting when the enemy's foremost defended localities has been penetrated, in unexpected encounters between bodies of men in woods or confined places, or at night.

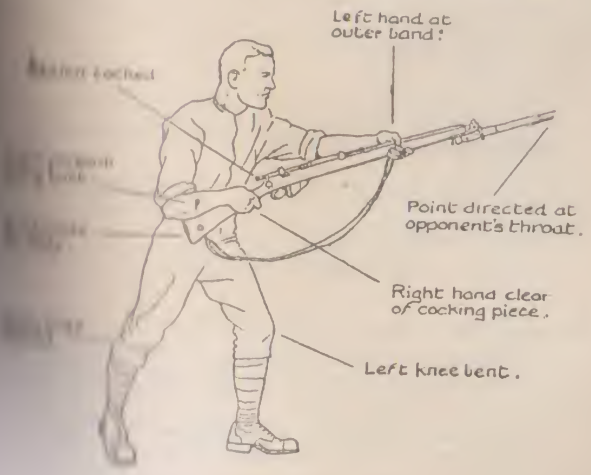


Fig. 1.—On guard.

3. The object of bayonet training is to fit the soldier to take his pla as one of a team, with confidence in his own and his comrades' sk with the weapon, and to instil determination to close with the enem The importance of the offensive spirit will, therefore, be emphas throughout training.

4. Once hand-to-hand fighting begins, it should be the instinctive act of the man either:—

i. to go straight for an opponent, who may have offered some openi or

ii. first to parry an opponent's attack and then immediately counter-attack.

5. Figures 1 to 5 illustrate the basic positions from which the mast power and control can be exercised. The instruction is developed in detail in S.A.T. Vol. I, Pamphlet No. 12. Three examples follo Sections 2, 3 and 4.

2. Lesson on the Training Stick

Stores.—One training stick for each pair of men in the squad. Scab tied on.

The training stick, efficient instruction in which forms an im part of bayonet training, should always be used with vigou individual using the stick will act as "master" and the individual the bayonet as "pupil". The value of the practice to the pupil entirely on the energy displayed by the master.

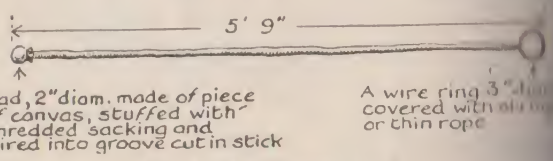


Fig. 6.—The Training Stick.

1. How to use the training stick (*see* Fig. 7).

i. The padded end will represent the point of the opponent's Whenever it is directed towards the man, he will assume the *on guard* position.

The ring will represent a vulnerable part of the it is presented, an advancing point will be made at

ii. The method of holding the stick is as follows:—With end forward, adopt the *on guard* position, the right one foot from the ring. To present the ring upright

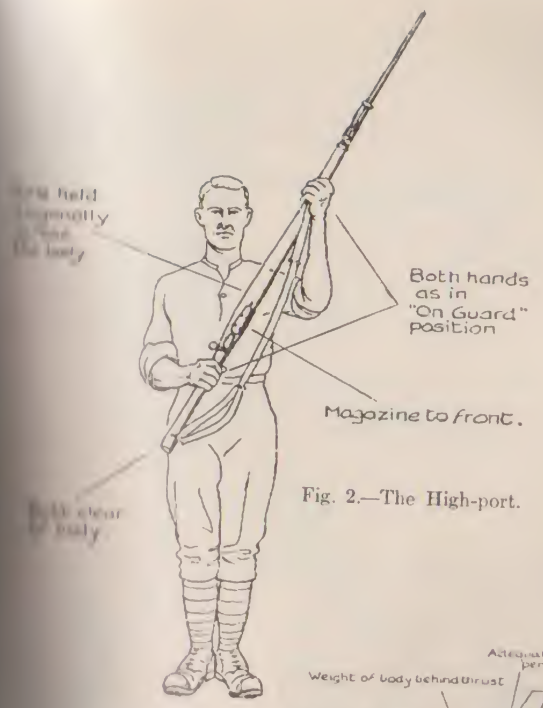


Fig. 2.—The High-port.

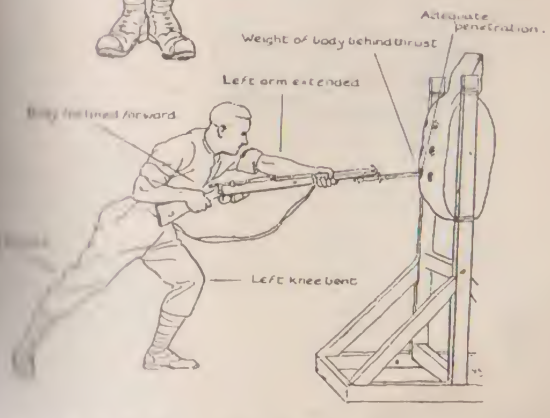


Fig. 3.—The point.

Fig. 7.—Use of the Training Stick.

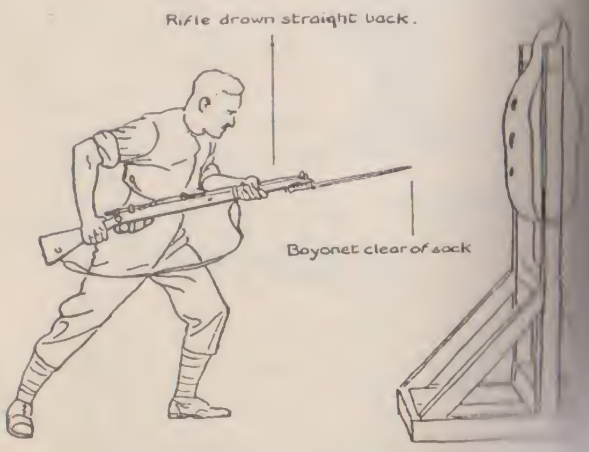


Fig. 4.—The withdrawal from the point.

withdraw the left arm until it is close to the body and at the same time place the ring to the right, or alternatively withdraw the left arm as before and at the same time step back with the left foot, placing the ring clear of the left of the body. The distance from the ring to the bayonet must be such as will cause the man to make an *advancing point*.

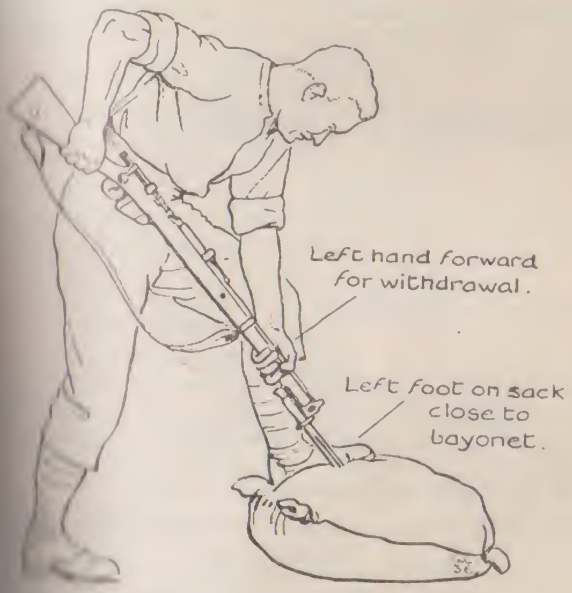


Fig. 5.—The withdrawal (using foot).

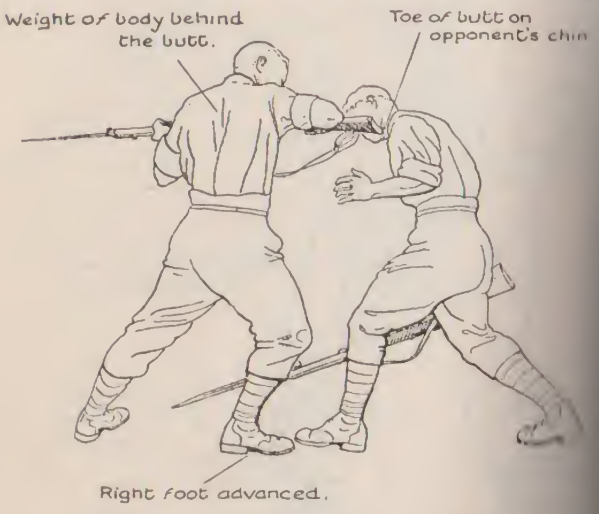
The method of using the stick ensures that the position of the [illegible] need never be changed, no matter what action is being [illegible], and complete control of the stick is maintained at all [illegible]

3. The Butt Stroke

[illegible] butt stroke and kill.

[illegible] that *left parry* must be made fairly wide to beat off [illegible]'s weapon; therefore opponent is inside man's guard. [illegible] cannot use his bayonet; therefore the butt must be used [illegible] *kill* with the bayonet.

ii. Demonstrate:—From the *on guard* position vigorously straighten the left arm, punch the rifle far enough forward and to the left to beat off the opponent's weapon, advance the rear foot and swing the rifle round horizontally to hit the opponent's chin with the toe of the butt, direct the bayonet on to the opponent deliver the point, withdraw, return on-guard and pass through.



The Butt Stroke.

*4. Firing from the Hip

1. In paragraph 1 of "General", Sec. 1, it states that the use of [illegible] must NOT be forgotten during hand-to-hand fighting.

A trained soldier can achieve a considerable degree of accuracy [illegible] from the hip at a range not exceeding 10 yards.

Stores.—Rifles, bayonets, row of standing dummies.

Squad falls in in single rank on the right of the dummies [illegible] scabbards off, actions cocked and safety catches forward.

1st Stage

i. The object of the lesson is to kill an opponent by firing [illegible] hip at ranges up to 10 yards—in other words, the range [illegible] bayonet is lengthened.

*Added to Pamphlet 12 by Appendix D of Weapon Training Memorandum [illegible]

(i) Demonstrate complete action of firing from the hip, instructor about 5 yards from dummy.

(ii) Repeat demonstration with detail:—

(a) Correct "On guard" position, except that finger will be on the trigger.

(b) The lowering of the point of the bayonet by vigorously straightening the left arm and at the same time ensuring that the butt of the rifle is not lowered or withdrawn. Emphasis must be laid on the natural tendency to shoot high. It is essential that the point must be lowered to the opponent's feet.

(c) The firing of the round. This will be done simultaneously with the lowering of the point and entirely by sense of direction. Reload immediately.

2nd Stage

Rifles, bayonets, three rows of dummies, and training sticks.

This Stage will be subdivided as follows:—

(i) *Attacking three rows of dummies. As for 1st Stage.*

1st row to be attacked with the bullet, 2nd and 3rd rows with the bayonet.

At the walk and the double.

(ii) *With the training stick only. As for Lesson on same.*

Introduce the use of the bullet at a range of between 5 and 10 yards by the command "Bullet," interspersed with the use of the bayonet in the normal way. The command "Miss" will be occasionally given, whereupon the attacker will use the bayonet.

3rd Stage Open range—Tracer S.A.A. Fig. 2 targets (standing position).

The object of the instruction is twofold: Firstly, to illustrate the accuracy that can be obtained by the instinctive pointing sense and, secondly, the extreme importance of lowering the point of the bayonet to the foot of the target.

(i) Demonstrate from 10 yards. Class practices.

(ii) The Fig targets will be placed at the foot of the ricochet pit and three firers will be exercised at a time.

(iii) This training can be carried out with live ammunition where [illegible] on battle-shooting ranges.

PART THREE

APPLICATION OF FIRE

CHAPTER XII—Visual Training.....
" XIII—Fire .....

CHAPTER TWELVE

VISUAL TRAINING

Small Arms Training, Vol. I, Pamphlet No. 2. Infantry Section Leading
Notes on Map Reading

1. Object

1. To develop the powers of observation.

Modern weapons, the art of making the best use of natural cover, wide formations, indistinct uniforms and artificial aids to concealment have reduced the visibility of the enemy. Visual training is, therefore, of the utmost importance in order that the enemy shall not remain undiscovered.

2. Methods of Training

Exercises framed to stimulate the soldier's powers of observation begin early in his training and continue throughout his service. They should include the study of ground, impressions of size, range, etc., of targets and ground features, and observation of fire as an individual over various types of ranges. Training will begin with questions framed to develop the recruit's powers of describing what he sees; ordinary objects will be counted and figures of different colours will be placed somewhere in the open and sometimes under partial cover in front of various backgrounds. Men will be employed to show how movement catches the eye and how concealment closes a firer's position. Blank ammunition will be used to give practice in locating an enemy by sound.

3. The Military Vocabulary

Men will be familiarized with all terms applied to features of ground, colours, shapes and military objects generally, so that their powers of description and recognition may be improved. A specimen military vocabulary is appended; it is intended as a guide to instructors. These terms should be introduced as opportunity offers during the recruit's service. It should be increased by teaching the local equivalents and additional terms appropriate to, the station in which the unit is serving, for example (in Canada, and respective of region) the added terms

artificial features such as "silo," "elevator" (grain), "power dam," "snake fence"; the term equivalents: "trail" for ride or path, "gully" for ravine, "muskeg" for marsh, "rapids" for shallows; the sometimes necessary subdivision of the conifers into the many local tree variants of (e.g. type, "balsam," "hemlock," etc.; "scrub" or (perhaps) "sugar-bush" for copse, "prairie" for moor or common, "semaphore" for railway-signal, "turn-pike" for metalled road, "creek" for watercourse, etc.

Features, artificial:—

Track	Post and rail	fences.	Ferry.
Footpath	Wire		Ford.
Path	Iron		Windmill.
Gate	Hurdle		Railway signals.
Paved.	Sign post.		Church tower.
Metalled.	Pylon.		Factory.
Unmetalled.	Viaduct.		Crane.
Fenced and unfenced.	Culvert.		Gasometer.
Main roads.	Cutting.		Gable-end.
Bye roads.	Embankment.		Quarry.
Telegraph pole	Canal.		Ricks.
	Lock.		Stooks.

Colours:—

Yellow.	Red.
Blue.	Brown.
Green.	

Features, natural:—

Trees.	Copse.	Plough.
Hedgerow	Gorse.	Root field.
Wood	Corn field.	Stubble.

Topographical:—

Knoll.	Middle distance.
Saddle.	Background.
Slopes, forward.	Dead ground.
" reverse.	Cliff.
" concave.	Gorge.
" convex.	Ravine.
Foreground.	Clearing.
	Salient.

Military Engineering:—

Barricade.	Right angle.
Dug-out.	Square.
Defended post.	Triangle.
" locality.	Circular.
Observation post.	Vertical.
Blockhouse.	Horizontal.
Emplacements.	

Fire—Types of:—

Indirect.	Enfilade.
Oblique.	Overhead.
Flanking.	

CHAPTER THIRTEEN

FIRE

Infantry Section Leading

1. Fire Effect

Fire effect depends on the following: —

i. Selection of the fire position.
ii. Selection of the target.
iii. Indication of the target.
iv. Finding the range.
v. Whether to use concentrated or distributed fire.
vi. Clear fire control orders.
vii. Good fire discipline in the section.
viii. Due economy of ammunition.

2. Selection of Fire Positions

1. A fire position for any task requires:—
   i. A good view of the ground or target to be covered by fire.
   ii. Cover for the section from ground and air observation and fire.
   iii. Room for the free use of weapons.
   iv. Covered approaches.

2. **Field of fire.**—
   i. *Short ranges and surprise.*—The two principles to remember in attack and defence are, firstly, that the shorter the range more accurate is the fire, and, secondly that the greatest results obtained from fire when combined with surprise.
   ii. *Long range fire.*—In defence, it may not be desirable to open at long range. If ineffective, it may hearten the enemy, and allow him to protect himself by making greater use of ground and adopting more suitable formations.
   iii. *Enfilade fire.*—Enfilade fire should be employed wherever This is particularly important for the light machine gun which fire a number of bullets in a very short time along the line of fire. An enfilade target thus gives an opportunity for return for the ammunition expended. It is particularly when applied along an obstacle.

3. **Cover from fire and view.**—Steadiness and accuracy if the men are themselves under fire from the enemy. It necessary that section positions should be selected with concealment and cover from fire. For this reason, obvious positions close to well-defined landmarks, should be avoided of ground and cover is dealt with in detail in Chapter VII Section Leading. (See also "Ground and Formations", the

3. Indication of Target

1. To get fire effect, it is essential that section commanders should be able to describe a target so that it cannot be mistaken. This is the most difficult part of fire control and requires constant practice.

2. In the attack section commanders will be mainly concerned with controlling the fire of the light machine gun; this necessitates the fire order [illegible] understood by one man only. Little time will be available for elaborate fire orders which *must therefore be kept as short as possible.*

3. In defence, more detailed arrangements are possible and in certain circumstances the riflemen may be required to fire as well as the light machine gunners.

The section commander should first make a detailed study of the ground to his front and point out to his section positions likely to be occupied by the enemy, probable lines of approach, possible points from which the enemy may try to obtain observation, and areas where the [illegible] are likely to be particularly vulnerable to fire when advancing, [illegible] gaps in hedges where they will bunch, obstacles where they will be [illegible] under fire, or open spaces which they must cross. He should then [illegible] the most likely tasks for the different weapons in his section.

4. **Direct method.—The most simple form of indication is always [illegible]**—An obvious target can often be described unmistakably by [illegible] known as the direct method. *This method should be used whenever* [illegible] (Example: "Enemy on bridge.")

[illegible] less obvious cases the men should be first given the direction [illegible] look, e.g. slightly, quarter, half, or three-quarters right or left [illegible] direction in which the men are facing. (Example: "Half [illegible] gap.")

[illegible] the *range* will have been given immediately beforehand [illegible] and will thus be a further indication of the position of [illegible]

5. [illegible] with aids.—

[illegible]—It is impossible to describe some targets by the [illegible] method without fear of mistake, and in such cases the target [illegible] with reference to some other point which all the men [illegible] at once. This point is known as a *reference point.* [illegible] from this point the men's eyes are led to the target by [illegible] aids:—

[illegible] (right or left).

[illegible] clock ray.

[illegible] method.

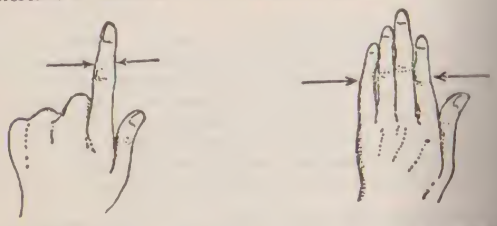
[illegible]

[illegible] aids may be used in combination, but the directions must [illegible] as short and simple as possible.

ii. *Reference points.*—These must be prominent and unmistakable objects and should be named. If possible, one or two [illegible] points, about 20 degrees apart in the arc of fire, should be made known to all the men of the section as soon as the post is occupied.

iii. *Vertical clock ray.*—This method is used for giving direction from a reference point, and should only be employed where there is a good view over the ground.*

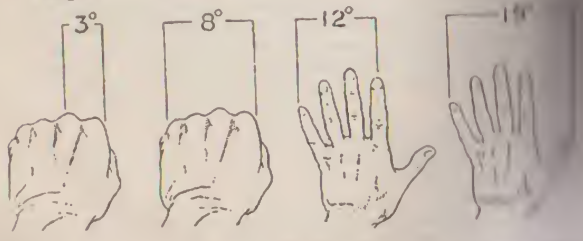
The reference point is taken as the centre of a clock hand vertically. The direction of any object is first pointed out by its position right or left of the centre followed by the appropriate clock hour. The words above and below should not be used when reference is made to 12 o'clock and 6 o'clock.



iv. *Finger method.*—This method is to give the number of fingers the target is to the right or left of a line between the observer and the reference point. The arm must be fully extended and the fingers held in a vertical position. The widest part of the fingers should be used. The reference point and the object should be clearly [illegible] on each side of the fingers.

v. *Degrees method.*—This method is to give the number of degrees the target is to the right or left of a line between the observer and the reference point. Degrees should only be used as a [illegible] when the target cannot be described by any simple method.

The following diagram shows a rough method of measuring degrees by the various parts of the hand when held at arm's length.



* Note: For illustration of method, see two examples used under "AIM".

4. Finding the Range

A knowledge of the correct range is required to obtain the maximum effect. It is particularly necessary in the case of the light machine on account of its close grouping. It is a useful aid for the recognition of targets.

The two normal methods of ranging are:—

(i) By observation of fire.
(ii) By judging distance.

The principal methods of judging distance are:—

1. *Unit of measure* (i.e. by measuring the intervening ground in terms of some familiar unit, such as 100 yards). This is only accurate for short distances and when all the intervening ground is visible.
2. *Appearance* (i.e. by the appearance of the object in relation to its size and visibility).
3. *Bracketing* (i.e. by estimating the largest and the shortest possible distances to the target and taking the mean).
4. *Halving* (i.e. by judging the distance to a point considered to be half way and doubling the estimate).
5. *Key range* (i.e. by judging the distance with reference to a known range).

Estimates made deliberately are much more likely to be accurate than those made in a hurry. Whenever time permits, section commanders will therefore prepare *range cards* on which should be marked the ranges of positions likely to be occupied by the enemy or of points over which he is likely to pass. (*See* "Range Cards").

5. Fire Control Orders

In visual training and recognition the lessons have been framed mainly for the benefit of the man in the ranks, but, however skilful the latter may become, fire effect will not be obtained unless the fire unit commander can give a correct fire order. The objects of the lessons in fire control are therefore:—

(i) To practise the fire unit commander in indicating targets and issuing fire orders;

(ii) To provide at the same time instruction for the man in recognition.

Training starts with simple fire control orders, progressing to problems of ordinary battle situations. Lessons, whenever possible, will be carried out on suitable ground in the vicinity of barracks: when this is impossible, use must be made of landscape targets.

Both leader and man must have constant practice throughout their training in seeing and acting upon fire control orders.

3. **A normal fire control order.—**

Sequence	Reasons	Order
(1)	(2)	(3)
Designation of Unit.....	To make it clear to whom the order is addressed.	"No. 5 Section."
Range.....	To concentrate in recognizing the target once the sights are set and to limit the area in which to search for target.	"Five hundred."
Indication.....	Direction and description of point of aim.	"Quarter left ... "Slightly right ... bush."
Number of bursts.....	To control ammunition expenditure and to ensure a lull in the firing for fresh orders if necessary.	"Five bursts."
Kind of fire.....	Dependent on the target and situation at the time.	"Fire" or "Re...

4. **Rates of fire, etc.—**

i. If "Bursts" is ordered, the firer will fire the named number ... "automatic" (normal bursts at the slow rate, i.e. 1 ... minute).

ii. If "single rounds" is required, the order "single rounds" ... given and the fire controlled by "Stop" and "Go on."

iii. If "rapid" fire is ordered, the gun will be controlled by ... and "Go on." (Only a very favourable target will justify ... bursts than the normal.) This applies also to riflemen ... rapid.

iv. If riflemen only are required to fire, the word "rounds" ... substituted for "bursts."

vi. The order "Bursts" given to a rifleman implies "rounds" ... as he is concerned.

6. Range Cards

1. The range card is an important item in defensive tactics ... to the infantry section, and though normally a responsibility ... senior N.C.O., selected men are taught their use and preparation. ... obtained to visible key points in the field of fire should all be ... on the range card, which is an article of store (or local purchase) ... as per the blank example shown.

2. The card is marked with four equi-distant semi-circles ... be used to represent any series of ranges from 800 to 2,000 yards ... to whether they are for use by a rifle, light M.G. or medium ... unit.*

3. The successive steps in filling in a range card:—

i. Mark off on the card the position from which the ... taken. Describe this position accurately.

ii. Select an unmistakable object in the arc or sector ... draw a thick setting ray to it.

NOTE.—(*) New development in the cartridge may ... limit to be doubled.

(6) Select objects to which ranges are to be recorded; these should include positions which the enemy may have to occupy or near which he is likely to pass; obstacles, a gap in a hedge, etc. Put in range to be represented by each semi-circle on the card.

(7) Keeping the card on the setting ray, draw rays to show the direction of the objects selected. The rays to be in lengths corresponding to the distances.

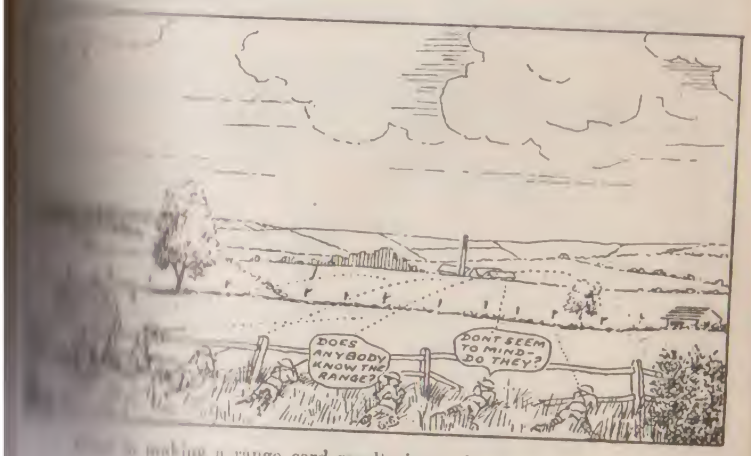
(8) Write short descriptions of each object as it appears to the naked eye. These should be written in block letters (*see* second example).

(9) Write range to each object against the description.

(10) Sign and date the card, and state how the ranges were obtained.

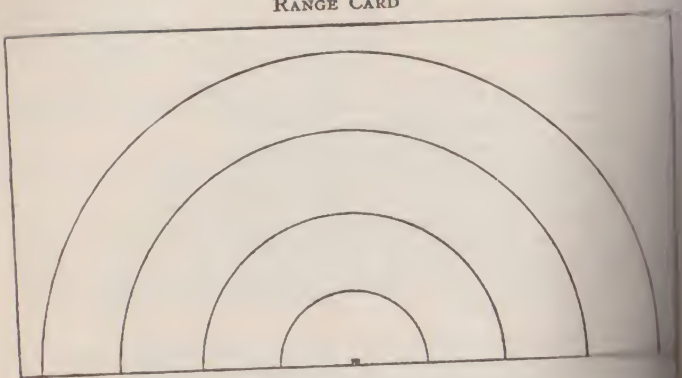
In use, the range card is set by raising the card to the level of the eye, and directing the setting ray on the object named. Once the card is set, objects ranged on can be identified at once by any observer.

(For M.G. units.):—When lines drawn at correct angles would be too near to one another that the range card could not be easily read, the card should be prepared with the angles opened out, and the number of degrees right or left of the setting ray written against each ray. (*see* third and fourth examples).



Failure in making a range card results in confused fire orders in an emergency.

RANGE CARD



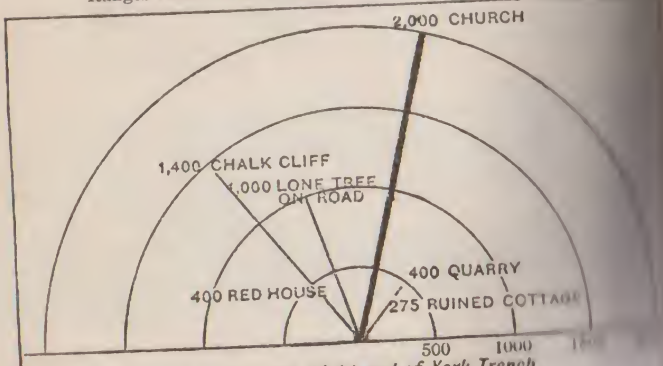
Point from which made out:-

Method of obtaining ranges:-

Made out by:- *Date:-*

RANGE CARD

Ranges suitable for a rifle or light machine gun section



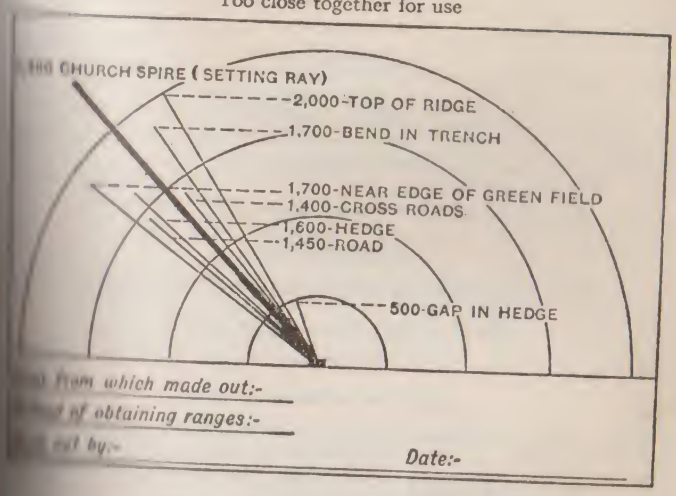
Point from which made out:- Right end of York Trench

Method of obtaining ranges:- Judged by eye, checked by Map

Made out by :- J. Wilson L/Cpl. 2/P.W.V. *Date:-*

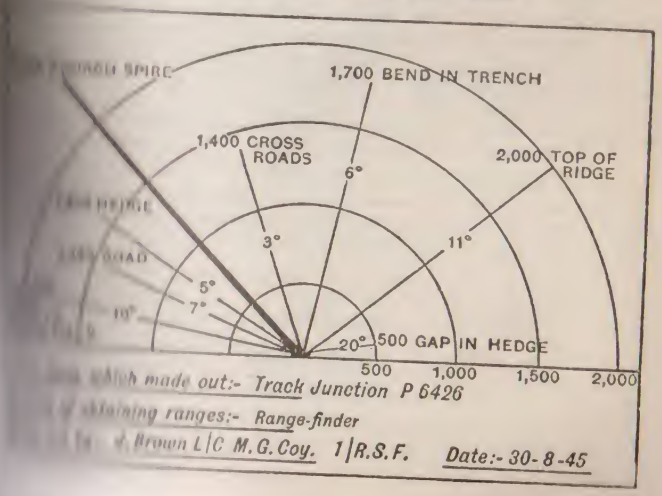
RANGE CARD—TRUE ANGLES

Too close together for use



RANGE CARD—ANGLES OPENED OUT

Ranges suitable for a machine-gun section



PART FOUR

PROTECTION AGAINST GAS

CHAPTER XIV—Protection against gas in the field.....
" XV—Respirators .....
" XVI—Respirator lessons for recruits and respirator drill..

CHAPTER XIV

PROTECTION AGAINST GAS IN THE FIELD

P.A.G. & A.R., Pamphlet No. 1, 1939.

TRAINING

Standard to be Attained

1. The object of anti-gas training is to ensure that individuals and units are capable of protecting themselves with the minimum loss of efficiency against all forms of gas attack. To achieve this object the requisite standards of training are as follows:

2. The soldier must be trained to:—

i. Maintain his personal anti-gas equipment in serviceable condition.
ii. Carry out his normal duties wearing his anti-gas equipment.
iii. Recognize the war gases; know how to protect himself against them, and be able to carry out first aid against them.
iv. Know the duties of a gas sentry and the warning signals for gas weapons.
v. Understand the use of the unit equipment issued to his section.
vi. Carry out personal decontamination and simple decontamination of his weapons, of vehicles, and of ground.

3. To ensure that the necessary standard is attained soldiers must be tested every year during the individual training season by means of the Tests of Elementary Training (Appendix C).

4. In addition, commanders of all grades must understand the gases likely to be employed by the enemy, and the measures required to protect those under their command against all types of gas.

WAR GASES

1. Definitions

1. *War gases.*—In chemical warfare the term "gas" is used for any substance, whether solid, liquid, or vapour, which is used for its irritant, or blistering effects.

Gases may be liberated in the air as vapour or smoke; or may be brought into contact, in liquid form, with personnel, material, or ground.

2. *Persistent and non-persistent gases.*—For military purposes war gases are described as "persistent" or "non-persistent".

Non-persistent gases are those which, when released into the air, disperse quickly, leaving no liquid contamination.

Persistent gases are liquids which evaporate slowly. They will give off vapour, or remain dangerous until the liquid has dried both on and below the surface on which they are placed, or until steps have been taken to render them ineffective.

3. *Toxic smokes.*—Toxic smokes are poisonous or irritant smokes, generated in the form of clouds of solid particles of arsenical compounds, small as to be invisible to the naked eye.

4. *Effective concentration.*—An effective concentration of gas is one which is sufficient to cause casualties or to force the wearing of respirators.

5. *Contamination.*—The term "contamination" is used to denote the presence of persistent gas in liquid or vapour form on persons, material, or ground.

2. Classification of Gases

War gases are classified into four groups according to their principal effects on the human body.

Choking gases.—Choking gases attack the breathing passages and lungs and will cause death if inhaled in lethal concentrations.

Nose gases.—Nose gases are toxic smokes which cause irritation in the nose, throat, and breathing passages, but do not cause death.

Tear gases.—Tear gases affect the eyes, causing them to smart and water, but they will not cause death.

Blister gases.—Blister gases are liquids which give off vapour. Contact of the body with liquid, or continued exposure to vapour will cause blistering after a period of delay. They are not classified as lethal, although death may follow exposure of the lungs to high concentrations of the vapour.

The principal gases of each group are described in the following sections. Certain details of some additional gases which though not normally classified as war gases, may possibly be encountered in war.

A table of gases is given in Appendix A.

Choking Gases

3. Phosgene

Appearance.—Under normal conditions phosgene is invisible except in the form of emissions, where it may be seen for a short while as a white gas. If there is much moisture in the air it forms a white fog which can be seen quite easily.

Persistency.—It is non-persistent, and has a definite smell of musty hay. It is decomposed by water, and is less effective in heavy rain. Below a temperature of 46° Fahrenheit it is a colourless liquid.

2 *Effects.*—

i. *On material.*—In high concentrations phosgene has considerable corrosive effects on metals.

ii. *On personnel.*—Phosgene sets up irritation in the breathing passages and the cells of the lungs, which results in the formation of fluid and interference with the supply of oxygen to the blood. This may cause death.

After inhaling phosgene a feeling of suffocation will usually be experienced, accompanied by coughing, and perhaps vomiting. These symptoms may then cease, and the affected person appear normal for some hours. If the lungs have been injured, however, the symptoms will return. Coughing will become more violent, breathing will become more difficult; the colour of the face may change to a purple or pallid hue; and death may result.

If the symptoms do not return within twenty-four hours the affected person may be regarded as out of danger. In some cases no ill effects may be felt for as much as twelve hours, when the symptoms will apear, and death may result in a short time.

3. *Protection.*—The respirator provides complete protection against phosgene.

4. Other Choking Gases

The most important of these are Chlorine, Chloropicrin, and Diphosgene. Chlorine is a greenish yellow gas which is visible and non-persistent. Chloropicrin is a yellow liquid which gives off an invisible vapour, which is persistent for a period of four to six hours. Diphosgene is similar in action to phosgene, but differs from it in that it is a liquid which vaporizes quickly, and is slightly persistent.

The effects of other choking gases are generally similar to those produced by phosgene, though the symptoms vary slightly in some respects. For instance, there is no "delay action" in the effects of chlorine as there is with phosgene, but the cough is more violent. It should be noted that some members of this group of gases, notably chloropicrin, are very poisonous as choking gases. Chloropicrin also causes severe vomiting.

For further details *see* Appendix A.

5. First Aid for Choking Gases

1. The respirator must be adjusted, and kept adjusted until clear of the gassed area. If it is damaged, a damp cloth should be put over the nose and mouth.

2. Rest and warmth are essential, and exercise must be avoided. Cases suffering from choking gas must be made stretcher cases. There is danger of relapse if slightly gassed cases, showing no outward signs of distress, continue to work.

3. Smoking must not be allowed.

4. Artificial respiration must not be attempted unless breathing has ceased.

5. Alcohol quickens respiration and therefore should not be taken. Hot sweet tea is the best substitute.

6. Affected persons must be evacuated to the medical services.

Nose Gases

6. D.M.

1. *Characteristics.*—D.M. is a yellow crystalline solid, which when heated or dispersed by high explosives, gives off a yellow smoke. This smoke is visible near its source, but may exist in effective concentrations after it has become invisible.

D.M. has no smell and can only be recognized when it begins to take effect on the body. It is non-persistent. It is not possible to produce in the field a concentration of D.M. which will cause death.

2. *Effects.*

a. *On material.*—Food or water into which pieces of solid D.M. have fallen should not be consumed, or arsenical poisoning may result. Water contaminated in this way should not be used for washing or shaving.

b. *On personnel.*—Exposure to an effective concentration of D.M. will cause irritation at the back of the nose and throat, with a burning pain and a feeling of tightness in the chest. This may be followed by sneezing, pains in the gums, coughing and possibly vomiting. Finally headache and severe mental depression may be caused. On leaving the gassed area or adjusting the respirator, the severity of the symptoms may temporarily increase.

3. *Protection.*—The respirator provides complete protection against D.M. Owing to its lack of smell, the gas may take effect before the respirator is adjusted. After adjustment the symptoms appear to increase, and untrained persons will be inclined to remove their respirators. If phosgene has followed the D.M., this may prove fatal to them.

Those who have previously been exposed to D.M. are more sensitive than those who have not, and may be able to give early warning to others.

7. Other Nose Gases

The commonest of these are D.A. and D.C. They differ little from D.M. though the effects of D.C. are more severe and are experienced quickly.

For further particulars *see* Appendix A.

8. First Aid for Nose Gases

The respirator must be adjusted and worn while in the gassed area.

Victims should be given hot tea or alcoholic stimulants.

Recovery is complete in a few hours, and affected persons will not need to be evacuated to the medical services.

Tear Gases

9. B.B.C.

1. *Characteristics.*—B.B.C. is a brown liquid which gives off an invisible vapour, and has a pungent, irritating odour similar to sour fruit. It is very persistent and may continue to give off vapour for several days. It is insoluble in water.

2. *Effects.*

i. *On material.*—Liquid B.B.C. will corrode metals. Food or water splashed with the liquid may be dangerous. The vapour will render them unpalatable but not dangerous.

ii. *On personnel.*—Even in very weak concentrations B.B.C. has a lachrymatory effect on the eyes. In strong concentrations intense pain will be caused, accompanied by a profuse flow of tears and spasms of the eyelids. Liquid splashed into the eyes may cause serious damage.

3. *Protection.*—The respirator gives complete protection against [illegible]

10. C.A.P.

1. C.A.P. differs from B.B.C. in the following respects:—

i. It is a white crystalline solid, which, when heated, gives off invisible smoke. A white smoke may sometimes be given with the heating mixture in the generator (Sec. **19**).

ii. It has little smell and is non-persistent.

iii. It has no corrosive effect on metals.

iv. In addition to the symptoms of B.B.C. it causes irritation [illegible] skin.

2. Appendix A gives details of other tear gases which may be [illegible]

11. First Aid for Tear Gases

1. Respirators will be worn in the gassed area.

2. In acute cases the eyes should be bathed with water in [illegible] of one teaspoonful of salt to one pint of water.

3. Tear gas casualties will not be evacuated to the medical [illegible] except when liquid has entered the eyes.

Blister Gases

12. Mustard Gas

1. *Characteristics.*—Pure mustard gas is a heavy, oily, [illegible] liquid, which is difficult to see on the ground. In its crude [illegible] dark brown. Both forms give off an invisible vapour [illegible] slight smell of onions or garlic. Familiarity with this smell [illegible] it to be less noticeable. Lack of smell does not mean that [illegible] not present. Mustard gas dissolves in spirits, petrol, oils and [illegible] liquid is quickly destroyed by chloride of lime (bleaching [illegible]

Powers of penetration.—Liquid mustard gas has great powers of penetration, and will soak into all but the most impervious surfaces such as smooth metals, glass, and glazed tiles. As it penetrates it tends to spread outwards. Its approximate powers of penetration are as follows:—

Through the skin	about 2 mins.
Thick clothing	about 10 mins.
Light summer clothing	a shorter period.
Soles of boots in good repair	about 24 hours.
Uppers of boots	about 3 to 4 hours.
Mackintosh material	about 1½ hours.

Vapour will also percolate through clothing.

Persistence.—Mustard gas is very persistent. Depending on weather conditions it may remain in a liquid and dangerous state for days or even weeks. It may persist under the surface of ground which appears free from liquid.

Even mustard gas may continue to give off vapour slowly for months. As the temperature rises the quantity of vapour given off will increase.

Effects on material and water.

On material.—Mustard gas has no effect on material, other than food. The presence of liquid gas on material will, however, make it unsafe to handle.

On food.—Liquid contamination of any food makes it unsafe for consumption. The contaminated portion must be removed.

On water.—Water is not affected by the vapour. The liquid is heavier than water, and will sink to the bottom. If left there it will gradually decompose, over a period which may amount to years, into harmless products. Boiling will accelerate the process. Water from a shallow contaminated source is dangerous.

Effects on personnel:

Liquid gas.—This will affect the eyes and skin, and, if taken internally, the stomach. One drop of liquid however small, which enters the eye will cause redness, swelling of the lids, and closing of the eye after one hour. Permanent blindness will result.

The skin will become red about two hours after contact with liquid gas, and irritation will begin. Blisters may be formed any time from eight hours after exposure.

Vapour.—Vapour in the eyes will not at first be felt. After four to eight hours the eyes will become red and sore, and within twenty-four hours they will be closed. Temporary blindness for two weeks or more may result.

In the lungs and breathing passages no symptoms appear at first. After six to eight hours the voice becomes husky and loss and complete loss of voice may follow. Later bronchitis and pneumonia may set in. These have been the cause of most deaths.

On the skin there are at first no symptoms. About twelve hours after being affected, redness and irritation begin, particularly

in those parts of the body which are moist, or where clothing fits tightly. Numerous small blisters may develop, tending to form a series of larger blisters.

iii. Only a small percentage of deaths from mustard gas is likely, and these will usually occur from exposure of the lungs to vapour. Large numbers of minor casualties may be caused if thorough protective measures are not taken.

6. *Protection.*—The respirator gives complete protection to the eyes, lungs, and the part of the face it covers. It should be adjusted immediately mustard gas vapour is smelled. The use of clothing and equipment for the protection of the rest of the body is described under "Personal Equipment."

13. Lewisite

Lewisite is similar to mustard gas in many of its characteristics and its employment. The following paragraphs describe the ways in which it differs from mustard gas.

1. *Characteristics.*—Lewisite is an arsenical compound which is colourless in its pure state. The vapour from pure lewisite has practically no smell, whilst that from crude lewisite has a smell similar to geraniums. Lewisite remains a liquid at much lower temperatures than mustard gas, and employment in cold climates is therefore to be expected. Lewisite is also less persistent than mustard gas.

2. *Powers of penetration.*—Lewisite is quicker in penetrating than mustard gas. It penetrates the skin almost immediately, and impregnates rubber and thin oiled fabrics in about half the time of mustard gas. But its penetration of rubber can be retarded by a special process. Heavy oiled fabrics afford reasonable protection, but, unlike mustard gas, lewisite destroys the oil film. Wet clothing has increased resistance to lewisite.

3. *Effects.*—

i. *On water.*—Lewisite is rapidly destroyed by large quantities of water. The resulting liquid contains arsenic, and is therefore dangerous to drink.

ii. *On personnel.*—Pain and irritation are felt immediately after contact with lewisite. In this respect it is easily distinguished from mustard gas. The swallowing of food or drink contaminated with lewisite may cause serious injury from arsenical poisoning.

Blisters from liquid lewisite will appear more quickly than those from mustard gas. The skin becomes red in fifteen to thirty minutes, and blisters appear from one to four hours later. The arsenical content of lewisite may be absorbed into the blood stream in sufficient quantity to cause death.

Irritation from contact with vapour will be felt from half an hour after contact, and blisters may follow in about two to eight hours.

14. First Aid for Blister Gases

Liquid blister gas.—The essence of first aid is to remove or neutralize the liquid before it begins to take effect.

If liquid enters the eye, the latter should be washed out immediately with clean water, care being taken not to contaminate the other eye. This action will not save the sight, but may reduce the size of the blisters and alleviate some pain. The affected person must be evacuated to the medical services.

If liquid falls on the edges of the eyelids, it should be wiped away from the eyes with a swab. Ointment, anti-gas, should not be used.

If liquid is visible on the skin, it should be removed by swabbing with cotton waste. Ointment, anti-gas, should then be applied. If contaminated clothing is removed or cut away within ten minutes, the majority of the liquid will not soak through to the skin.

Only ointment, anti-gas, No. 2, is effective in the case of contamination by lewisite.

Full instructions for the use of anti-gas ointments are given in Sec 26. Personal decontamination.

If anti-gas ointment is not available, one of the following expedients may be used:—

1. Bleach paste of a creamy consistency.
2. Methylated spirits or petrol.
3. Thorough washing with soap and water.

Ointment, anti-gas, or bleach paste are the most effective, but the one which can immediately be used should always be chosen. Ointment or any form of bleach treatment which is used after blisters have begun to develop will only aggravate the condition.

Mustard gas vapour.—The symptoms of contact with mustard gas may appear before it is realized that contact with the vapour has been made. If vapour has affected the eyes they must be washed, and the affected person evacuated to the medical services. Those whose breathing passages have been affected must also be evacuated.

If the skin has been affected cleansing treatment should be carried out as soon as possible. This consists of removing the clothes, washing with soap and water, and dressing in fresh clothes. The original clothes may contain liquid vapour, and should be decontaminated as soon as possible.

Ointment or bleach should be used after exposure to vapour.

Mustard gas blisters.—Mustard gas blisters must not be pricked, nor must any dressing be applied. They should be covered with a dressing as soon as they occur.

Some blisters contain arsenic. They must be pricked with a sterile needle as soon as possible, the liquid squeezed out, and a first-aid dressing applied.

The healing of a blister is a slow process, and there is danger of septic

GAS WEAPONS

15. The Employment of gas by an Enemy

Gases are employed in war with the following main objects:—

i. To inflict casualties.
ii. To harass and to reduce morale.
iii. To delay or assist in delaying an advance.
iv. To deny the occupation of ground except at the risk of casualties.

To inflict casualties choking and blister gases are employed.

To harass and to reduce morale all forms of gas may be used.

To impose delay or to deny the occupation of ground the blister gases by reason of their persistence, are the most suitable.

Full protection cannot be ensured unless a knowledge of gas weapons and the ability to recognize them is possessed by all ranks. Their description, characteristics, and warning signs are dealt with in the following sections.

Ground Gas Weapons

16. Cylinders

1. *Description.*—Cylinders used for chemical warfare are made of steel and measure about three feet in length. They weigh about 120 lb. when filled, but portable cylinders have been produced by some countries weighing about 48 lb. and constituting a load for one man.

2. *Employment.*—Cylinders are normally used for the release of choking gases. The larger types will emit gas at full pressure for from two to three minutes. They are usually employed in one of two ways:—

i. *The trench method,* in which cylinders are installed at intervals along a trench. Owing to the time and labour required to prepare a position, this method is unlikely to be used except in static warfare.

ii. *The beam method,* in which cylinders are usually mounted on vehicles from which the gas is released at the required time. In this manner a highly concentrated "beam" of gas is created.

The employment of cylinders depends entirely on the direction of the wind. In an adverse wind they cannot be employed at all. In favourable conditions and with large numbers of cylinders the gas may be effective up to 10,000 yards, and noticeable as far as 30,000 yards from the point of release.

3. *Warning signs.*—

i. When gas is emitted from cylinders a loud hissing noise can be heard for some hundreds of yards from the point of release.

ii. When moist conditions prevail phosgene will be visible as a white cloud for the first few hundred yards of its course. Chlorine is visible as a greenish-yellow cloud.

iii. If neither of these signs is apparent the only indication of gas will be the smell of the gas.

17. Projectors

Description.—Projectors are steel tubes which project metal drums containing gas to a probable maximum range of about 2,000 yards. When in use they are normally leant against some form of rest, or dug into the ground so that only the lip of the tube is visible. Large numbers may be fired simultaneously by electricity. When the drums reach the ground they are exploded by a fuze and burster, and the gas is released. Projectors are one-round weapons in that they have to be set up again after each shot.

Employment.—Any type of gas can be used from projectors, but the most likely are choking and blister gases. Projectors will probably be used in large numbers against area targets. The high gas content of the drums makes them suitable for producing high concentrations of choking gas, or for the heavy contamination of ground. Their use in mobile warfare is unlikely until some hours after contact has been gained. The direction of the wind does not entirely govern the use of projectors as does the use of cylinders. A strong adverse wind may, however, make their employment inadvisable.

Warning signs.—

A loud explosion can be heard when projectors are fired.

The drum can be seen during flight and a "swishing" noise can be heard.

After the drum has travelled about 200 yards the gas check can be seen falling to the ground.

After the drum reaches the ground there is a delay of some seconds before it explodes. The noise of the burst is small.

At night a bright flash can be seen when the projector is fired, and a trail of sparks follows the drum.

18. MORTARS

Description.—Various types of mortar have been used for chemical purposes. The commonest is one of about 4-inch calibre working on the Stokes principle. Ranges up to about 2,700 yards have been obtained, though these may be increased in the future.

Employment.—Mortar bombs may be filled with any type of gas. The high gas content of the bombs, and the rapid rate of fire enable high concentrations or heavy contamination to be produced, provided adequate supplies are available. Unlike projectors they are able to fire repeatedly from the same position.

Mortars are more accurate than projectors, and are similarly affected by weather conditions. If the supply of ammunition permits, their employment in mobile warfare is probable.

Warning signs.—Gas bombs from mortars have a comparatively small bursting charge, and the displacement of earth and noise of explosion are small compared with H.E. bombs. The smell or effect of the gas will usually provide the only other warning.

19. Generators

1. *Description.*—Various types of generator have been produced, the majority consisting of an outer casing which contains both a heating compound and the gas in solid form. A fuze is used to ignite the heating mixture which generates the gas as a smoke.

2. *Employment.*—Generators may be filled with nose or non-persistent tear gases. If sufficient numbers are used under favourable weather conditions, the cloud generated may travel in an effective concentration for distances up to 30,000 yards. A favourable wind is essential, and a successful attack requires the release of relays of generators at short intervals. Owing to the ease with which they are carried their use in mobile operations is to be expected.

3. *Warning signs.*—The smoke produced by the heating mixture is visible for some distance. The first effects of the gas will provide the only other warning.

20. Artillery Gas Shell

1. *Description.*—Various types of shell have been used in chemical warfare. As a rule they have been designed on the same principles as those used for high explosives. The gas content is small and much of it may be buried in the shell crater.

2. *Employment.*—Any type of gas may be used in shells. Owing to the range and accuracy of artillery the use of gas shell is not dependent on the direction of the wind. Fire can be switched quickly from one target to another, so that the harassing effect of gas shell may be considerable. Owing to their small gas content, large quantities of ammunition are required to produce high concentrations of non-persistent gas, or to contaminate heavily any but small areas. Their sustained employment for these purposes in mobile warfare is therefore unlikely, though under static conditions difficulties of ammunition supply may be overcome.

3. *Warning signs.*—The displacement of earth and noise of explosion are small in comparison with H. E. shells. The smell or effect of the gas will provide the only other warning.

Weapons Employed by Aircraft

21. Aircraft Bombs

1. *Description and employment.*—Aircraft bombs have a relatively thin outer casing, thus permitting a high gas content. They range in size from about 30 lb. to more than 3,000 lb., and may be filled with any type of gas.

In the theatre of operations blister gas will probably be the normal filling, as effective concentrations of non-persistent gas are not likely to be achieved in built-up or enclosed areas. Non-persistent gas mixtures may be used in the larger bombs.

To contaminate small areas of ground large numbers of small bombs will probably be used. A 50-lb. bomb filled with blister gas will contaminate heavily an area of about 150 sq. yards, and lightly about 500 sq. yards, the majority of the contamination down-wind.

In back areas bombs filled with blister gas may be used in conjunction with H.E. and incendiary bombs to make the work of rescue, repair, and fire fighting more difficult.

Warning signs.—The noise of explosion is smaller than that of H.E. bombs. Apart from this the smell or effect of the gas is the only warning

22. Aircraft Spray

General description.—Blister gas may be carried by aircraft in containers and released in the form of liquid spray by day or by night. The liquid falls to the ground in many drops of varying sizes. The larger drops, as heavier, will fall to the ground nearer to the path of the aircraft than the smaller drops, which are carried further down-wind. The spray is visible except when released at low heights, when the liquid can be seen leaving the container. The average rate of fall is about 1,000 feet per minute. Therefore at high altitudes there will be considerable delay between the release of the spray and its arrival on the ground.

The size of the area sprayed depends upon such factors as the height and speed of the aircraft; the quantity of gas released; and the strength of the wind and course of the aircraft in relation to it.

To contaminate ground effectively spray must be released at very low heights and the area covered by one aeroplane is small. The use of aircraft for this purpose is therefore unlikely.

Spray is essentially an anti-personnel weapon. Drops falling on the exposed skin will cause blisters unless adequate precautions are taken. Large drops will in addition penetrate clothing.

Mustard gas is the most suitable blister gas for spraying, as it is not affected by atmospheric conditions. It is unlikely that lewisite will be employed from above 2,000 feet in hot or humid climates. Even in temperate climates it cannot be employed up to the same heights as mustard gas.

Spray is classified, according to the height at which it is released, into low, medium, and high spray.

Low spray.—Low-spray attacks may be released at any height below 100 feet, and may often be combined with low-flying attacks with machine-guns or bombs. One aeroplane can spray effectively a narrow belt of ground 1,000 yards or more in length, according to its height, speed and load. If the aeroplane is flying very low, the liquid will fall in a heavy shower and may remain effective on suitable ground for several hours. Persons caught in such a shower will be thoroughly contaminated.

Aircraft delivering low-spray attacks are very vulnerable to small arms fire and such attacks are unlikely to be attempted except against "worthwhile" targets. Deployed troops and vehicles will not be worth the risk of attack, and dispersion is consequently one of the best means of protection.

Medium spray.—Medium-spray attacks are carried out from between 100 and 1,000 feet. The area sprayed by one aeroplane will be larger than in the case with low spray, but individual drops will be farther apart

and the degree of contamination will therefore be lighter. Many attacks may be delivered from between 3,000 and 4,000 feet, out of range of small arms fire. At these heights the spray cannot be seen in the air but at lower elevations and under favourable weather conditions it may often be seen leaving the aircraft.

When in close contact with the enemy medium-spray attacks in forward areas may be dangerous to friendly troops. They are therefore unlikely to occur in advance of the rear portions of forward divisional areas. Favourable targets may include camps, artillery positions, dumps and headquarters in areas where anti-aircraft defence is light. At medium heights aircraft are very vulnerable to the fire of anti-aircraft artillery.

4. *High spray.*—High-spray attacks are delivered from heights above 4,000 feet. According to the strength of the wind and height of the aircraft, the spray may fall in areas which are a considerable distance down-wind from the course of the aircraft, and at an appreciable time after it has passed. There will therefore be no warning of an impending attack. If the risk of casualties is to be avoided, protective measures must at all times be taken in the open (Sec. **25**).

The area covered by high spray is large. One aeroplane may cover effectively an area of more than a mile square, and within it all persons who do not take protective measures may become casualties. For some down-wind there will be a larger area where the spray will fall in very small drops, and in which persons may not be affected unless drops enter their eyes or fall on exposed parts of their bodies.

Owing to the large area covered by high spray its use will probably be restricted to back areas.

Individual Protection

23. Personal

1. Every individual will carry in the field the following personal equipment:—

Respirator.
Eye-shields, anti-gas [6].
Cape, anti-gas.
Detectors, gas, individual [2 pairs].
Ointment, anti-gas, No. 1 or 2 [2 tins].
Cotton waste [1 oz.].

In addition, each officer and N.C.O. will carry one pad of detector, gas, ground.

Descriptions of articles of personal equipment are given under "Personal Equipment".

2. *The respirator.*—The respirator is dealt with fully in P.A.T. It provides complete protection against choking, nose, and lung irritants, against the effects of blister gas vapour on the lungs and breathing passages. It should be adjusted whenever gas is smelled or a warning other than the "spray alarm" is sounded. A high state of efficiency is required. All ranks should be capable of carrying out these drills in respirators and be able, on occasions, to sleep in them.

Equipment for protection against blister gas.—The greatest measure of protection practicable against liquid blister gas is given by anti-gas suits, which also give a measure of protection against vapour. These suits could not be worn generally by troops in forward areas without considerable reduction in their fighting efficiency. They are issued therefore only to those who require special protection by reason of their duties or who have to work in heavily contaminated areas.

Anti-gas eye-shields, anti-gas capes, and individual gas detectors are issued primarily for protection against aircraft spray (Sec. **25**). Anti-gas ointment and cotton waste are issued primarily for personal decontamination (Sec. **26**). See also Chapter Fifteen.

24. Protection Against Choking Gases

Choking gases are employed primarily as offensive agents with the object of causing casualties. Nose and tear gases are used mainly for their harassing effect, to force the continuous wearing of respirators, and so lowering morale.

The protection afforded by the respirator, and an efficient system of gas discipline, should prevent the occurrence of casualties from choking gases. There are, however, certain ruses which an enemy may adopt to overcome this protection, and a knowledge of them is required by all ranks.

The following are examples of such ruses:—

Smoke may be discharged with a choking gas mixed with it.

A new, strong smelling, but harmless gas may be employed to force the wearing of respirators. After it is known to be harmless, a choking gas may be mixed with it.

A nose gas may be used, followed by a choking gas. The effects of the nose gas may cause badly trained troops to remove their respirators, with fatal results.

A choking gas may be used at hours of the night and early morning when large numbers of men may be caught asleep without respirators adjusted.

These examples serve to emphasize the necessity of a high standard of discipline and a mind which will regard all uses of gas and smoke with suspicion.

25. Individual Protection Against Aircraft Spray

The use of anti-gas equipment.—As a protection against aircraft spray anti-gas eye-shields and individual gas detectors should always be worn in action, the former to prevent blindness (Sec. **12**, 5), and the latter to give warning that the wearer has been contaminated.

Anti-gas capes should be carried by all ranks unless otherwise ordered. Details of the positions in which they may be worn, and the circumstances in which each should be adopted is given in Sec. **29**.

Personnel sleeping in the open should wear eye-shields, and be provided with capes.

2. *Action when the "spray alarm" is sounded.*—When the spray alarm is sounded, every individual will:—

i. Take cover if possible.
ii. Examine his individual gas detectors.
iii. Carry out personal decontamination according to the size of drops on his detector.

The sounding of the "spray alarm" does *not* mean that the cape should immediately be adjusted to the "worn" position. In fact, after the "spray alarm" has sounded the cape should be adjusted to the "worn" position only provided that there is no evidence of contamination on the individual and that there is no cover available.

3. *The use of detectors, gas, individual.*—Individual gas detectors change to a red colour where drops of spray have fallen on them. The detectors should be compared in size with the mark on each detector to determine the minimum size of a drop which will penetrate service and anti-gas clothing (Plate VII), and cause a blister if outer clothing is not removed (Sec. **26**). This is known as a "large drop." When large drops have fallen, personal decontamination should be carried out as described in Sec. **26,** 1, i. When small drops have fallen the sequence described in Sec. **26,** 1, ii, should normally be followed; but, when a man is covered with large numbers of small drops, which may run together, as in the conditions of low spray described in Sec. **22,** 2, then he should act as if he had been sprayed by large drops.

4. *The use of the respirator.*—The respirator plays no part in protection against aircraft spray unless vapour can be smelled. Unnecessary exposure of the respirator to contamination by spray must be avoided. The facepiece must **not** be adjusted before personal decontamination has been carried out.

26. Personal Decontamination

1. *The sequence to be followed.*—Prompt personal decontamination is the only way of preventing injury from contamination by liquid blister gas. Contamination by blister gas vapour should be dealt with as described in Sec. **14,** 2.

The essence of personal decontamination is the immediate application of anti-gas ointment and the removal, when necessary, of contaminated clothing.

2. *The application of ointment, anti-gas.*—Anti-gas ointment No. 1 is effective only against liquid mustard gas. After removal of any liquid contamination with cotton waste or other swab, the ointment should at once be rubbed thoroughly into the skin for a period of about a minute. It should then be removed with cotton waste or swabs.

Anti-gas ointment No. 2 is effective against liquid mustard gas and lewisite. It should be applied to contaminated skin in small quantities and rubbed in until it vanishes.

Owing to the rapid action of lewisite, ointment No. 2 must be applied within one minute of contamination if blisters are to be prevented.

The following is a guide to the use of ointment Nos. 1 and 2 against liquid mustard gas:—

Applied within 5 minutes of contamination	Blisters will be prevented.
Applied from 5 to 15 minutes after contamination.	Blisters will be less serious.
Used between 15 minutes of contamination and the time when reddening of the skin begins.	Ointment will still have some preventive effect.
After reddening has started.....	Ointment should not be used as it would do more harm than good. Affected parts should be washed.

(2) *The removal of contaminated clothing.*—Liquid mustard gas, except in the form of small drops of spray, will penetrate service dress clothing in ten minutes and anti-gas capes after 1½ hours. Liquid lewisite will pass through the same clothing in a considerably shorter time. The times taken to penetrate other types of clothing will vary according to the weave and material concerned (Sec. **12**).

When clothing becomes contaminated with liquid mustard gas or lewisite other than with small drops of spray, it must be removed, or the contaminated portion cut away at the first opportunity, if blisters are to be avoided. (*See* sequence for decontamination in para. 4, below.) Anti-gas capes become contaminated under the same conditions, but continue to afford protection for 1½ hours, but must then be removed if blisters are to be avoided. Clothing which has been removed must be dealt with in accordance with the instructions contained in Sec. **76** (4) (a) and A.R., Pamphlet No. 1.

(3) The sequence to be followed is given below. In principle it is the same for all types of contamination, but special provision has to be made for contamination by small drops of spray which may not be felt on the skin.

(a) *Any form of contamination other than by small drops of spray:*—

(1) Rub anti-gas ointment on the hands (*see* para. 2, above).
(2) Remove with cotton waste any free liquid on the exposed skin.
(3) Rub ointment on any exposed skin which may have been affected. (In the case of spray this means all exposed skin.)
(4) Remove or cut away any contaminated clothing.
(5) Take off anti-gas eye-shield if affected.
(6) Rub ointment on any skin where liquid has penetrated the clothing.
(7) Wipe off any ointment remaining with cotton waste.
(8) Put on fresh eye-shield (if required).
(9) Put on fresh clothing as necessary and available.
(10) Put on new individual gas detectors (if old ones affected).

(b) *Contamination by small drops of spray:*—

(1) Rub ointment on face, hands, and neck (*see* para. 2, above).
(2) Take off eye-shield.
(3) Wipe ointment off face and neck with cotton waste.

(*d*) Put on new eye-shield.
(*e*) Change individual detectors, or mark the spots on the old one.
(*f*) Wipe ointment off the hands.

Before carrying out personal decontamination personnel should, if the situation will allow, move out of contaminated areas. If this is not possible, they must take care not to put their rifles or other equipment on the ground while removing clothing. When it is not necessary to remove clothing, personal decontamination can be carried out on the move.

5. *Considerations affecting contaminated equipment.*

i. *Web equipment.*—Contaminated equipment will normally be dealt with in a similar manner to contaminated clothing (para. 3, above). There may be occasions, however, when reserves of equipment are not readily available, and it is considered a justifiable risk to continue wearing contaminated equipment.

Under such conditions the following action may be taken. Remove all free liquid as soon as possible with cotton waste and apply anti-gas ointment to the contaminated parts. This will often prevent the liquid from penetrating to the skin, except at points where the equipment is in close contact with the clothing or skin, e.g., shoulder-straps and chin-straps (including the chin-straps). Even so the application of ointment will greatly lessen the effects of the gas.

ii. *Steel helmets.*—Liquid blister gas should be wiped off steel helmets and the contamination will then weather. Care must be taken not to touch the affected parts, nor to place other helmets on top of them.

27. Protection Against Blister Gas Vapour

1. The danger from blister gas vapour depends largely on the length of exposure. Vapour will affect all parts of the body, but those parts (e.g. arm-pits) normally covered by clothing are the most sensitive. Anti-gas suits will provide protection to personnel required to remain in high concentrations of vapour, subject to certain limitations.

2. There may often be circumstances, however, in which personnel are obliged to remain in a vapour concentration with no means of protection other than that afforded by their personal equipment.

Even in the "worn" position (Sec. **29**) the anti-gas cape is liable to penetrate by the cuffs, neck and skirt. The cape therefore does not afford anything resembling effective protection against vapour. When worn, however, the effects of exposure may be diminished by

i. tightening the cuffs of the cape;
ii. preventing the admission of vapour round the neck by means of a handkerchief or cloth;
iii. folding or tucking in the skirt of the cape in "sac" fashion.

3. Personal decontamination affords no protection against blister vapour. First aid treatment is described in Sec. **14**, 3.

28. Eye-shields, Anti-gas

The function of eye-shields is to protect the eyes against liquid blister gas (Sec. 25).

Eye-shields are issued in packets of six and are carried in the respirator haversack. Before use the two press studs are engaged to shape the eye-shield to the forehead, and the elastic is adjusted to the required length. Too tight an adjustment may cause discomfort and dimming.

If damaged or contaminated, eye-shields should be discarded. They are not gas-tight, and in no way replace the respirator.

29. Capes, Anti-Gas

Anti-gas capes are made of oiled fabric and are designed to give protection against aircraft spray. They will never afford complete protection against blister gas vapour, though the effects of the latter may be diminished in the circumstances described in Sec. 27. Under normal conditions liquid gas will penetrate the cape after a minimum of 1½ to 2 hours.

There are three positions in which the cape may be carried. In deciding which position to adopt commanders must be guided by their military knowledge and their common sense:—

The "worn" position (Plate III).—In this position the cape is put on over all the equipment including the respirator. It is held in position by passing the two tapes from the back over the shoulders and under the arms, crossing them on the back, and fastening them in front by tying in a bow. The arms should be through the sleeves and the buttons done up. The "worn" position is the only position which affords maximum protection against aircraft spray. It involves, however, a certain loss of efficiency.

The "alert" position (Plate IV).—In this position the cape hangs from the shoulders down the back, and is held in place by tapes secured as for the "worn" position. To obtain the maximum protection quickly it is only necessary to pull the cape round the body.

The "rolled" position (Plate V).—In this position the cape is carried rolled on the shoulder. Full instructions for adjusting it are contained in Appendix B. The "rolled" position may be adopted when on the march, or during movement in mobile operations. Since rolling shortens the life of the cape, the "rolled" position will only be employed when specially ordered. Capes which have already been contaminated should not be rolled.

By means of a quick release knot the cape can quickly be unrolled and pulled round the body to afford the maximum protection. This will take slightly longer than from the "alert" position.

30. Ointment, Anti-gas, No. 1

Tins of this ointment (or of ointment No. 2) are carried by all officers and other ranks in a pocket of the respirator haversack and a pocket in the anti-gas cape. Anti-gas ointment No. 1 destroys liquid mustard gas but not liquid lewisite. It should not be used as a prophylactic by smearing it on the exposed skin, as it will cause severe irritation.

Instructions for the use of ointment No. 1 are given in Sec. **26**.

31. Ointment, Anti-gas, No. 2

This ointment is issued in pots, or in tins containing tubes, and is carried in a similar manner to ointment No. 1. It is a type of vanishing cream which will destroy both liquid mustard gas and lewisite. To be effective against lewisite it must be applied more quickly than against mustard gas.

It is possible to use ointment No. 2 as a prophylactic against the vesicants of mustard gas and lewisite, but it has an irritant effect if left on the skin. It should therefore only be used in this manner in cases of emergency. It may give protection in cool weather for about five hours, but in hot weather, and on parts of the body where the clothing touches the skin, this period will be much reduced. Instructions for the use of ointment No. 2 are given in Sec. **26**.

32. Cotton Waste

Cotton waste is carried by all ranks in the pockets on the respirator haversack and cape. It is used primarily as swabs for the removal of heavy liquid contamination and of ointment No. 1, from the skin. Used swabs should be buried, e.g. in a heel-mark, or burned.

33. Detectors, Gas, Individual

These take the form of a pair of half-sleeves which are put on over the clothes on both arms. The pair not in use is carried in the pocket of the respirator haversack. By a change of colour where the drops fall on them, the detectors serve to indicate to a man whether or not he has been sprayed with blister gas. They should always be worn in the attack. A mark is made on each detector of the size of the smallest drop likely to penetrate full service dress clothing, and so causes a casualty if precautions are not taken (*see* Plate VII, Fig. II, which illustrates the minimum size of large spots).

The action to be taken when spray falls on a detector is given in Sec. **25**.

34. Detectors, Gas, Ground

1. These are pieces of stiff paper, about two inches by [illegible] made up in pads of twenty-five. A pad is carried by each N.C.O. They are used to delimit the extent of liquid blister gas contamination on ground or material on which the gas has been [illegible]

or on which its presence is suspected. They will not react to vapour nor to under-surface persistence, and cannot therefore define an area as safe to occupy.

2. Detectors are employed on the end of a stick or bayonet, by pressing them firmly on the ground for about ten seconds. If the colour changes to a reddish hue, the presence of blister gas is confirmed. On muddy or sandy surfaces or where crude mustard gas has been used, the change of colour may be difficult to see. It can usually be confirmed by inspection of the back of the paper.

These detectors will also react to liquid K.S.K. and B.B.C. The lachrymatory effect should indicate the presence of these gases, while possibly masking the presence of blister gas.

APPENDIX "A"—LIST OF WAR GASES

Gas (1)	Classification (2)	How to recognise (3)	Effects on the body (4)	Action to be taken in gas attack (5)	First aid (6)	Remarks (7)
Choking Gases: 1. Phosgene	Non-persistent lethal.	Invisible. Smell of musty hay.	Coughing, choking sensation, difficulty in breathing. Later skin changes to a bluish red colour. Cough may cease temporarily, but symptoms may recur up to 24 hours. If no symptoms by then gas has had no effect.			—
2. Diphosgene	Slightly persistent lethal.	As above	As above	For all choking gases adjust respirator. This gives complete protection	For all choking gases. If gas present adjust respirator, if no respirator place damp cloth over mouth and nose. Remove from gassed area. Warmth, hot sweet tea. No alcohol or smoking. Immediate evacuation to nearest medical post. Do not apply artificial respiration.	
3. Chlorine	Non-persistent lethal.	Smell of bleach. Greenish yellow colour.	Violent coughing, choking and difficulty in breathing. No recurrence when cough ceases. If no symptoms after attack gas has had no effect.			
4. Chloropicrin	Persistent (about 3 hours).	By its effect on eyes and lungs.	Tears. Irritation of nose and lungs, followed by coughing and vomiting			
[illegible]	[illegible]	[illegible]	[illegible]	For all nose gases. Adjust respirator. This gives complete protection	For all nose gases. Adjust respirator [illegible] may be given. [illegible]	For all nose gases. Immediately after adjusting respirator symptoms tend to [illegible] but [illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] hours.
[illegible]	[illegible]	[illegible] RED where in contact with liquid	*Liquid.* [illegible] eyes, may cause permanent blindness. *Skin.*—No immediate effect, irritation in about 2 hours followed by blisters in 8–12 hours. If swallowed stomach pains, vomiting and probable death.	*Liquid.* Apply ointment AT ONCE to skin. *Clothes.*—Large drops remove outer clothing. Small drops no action necessary.	*Liquid.* *Eyes.*—Wash out with water for 10 minutes, evacuate to nearest medical post. *Skin.*—Apply ointment or bleach cream to exposed parts for 1 minute, then remove. As last resort wash with soap and water *Blisters.*—Apply dry dressing. Do NOT prick.	Eye-shields will always be worn in the open. Detectors gas, individual will be worn to give warning. Anti-gas capes should be worn in areas where spray is expected and should be used as a cover when sleeping in the open.
[illegible]	[illegible]	[illegible]	*Vapour.* *Eyes.*—Pain and redness in 4–8 hours. Temporary blindness. *Lungs.*—No immediate effect, cough 6–8 hours after. Liable to pneumonia. *Skin.*—No immediate effect irritation in about 12 hours followed by blisters.	*Vapour.* Adjust respirator and where possible move out of concentration.	*Vapour.* Evacuate eye and lung cases to nearest medical post immediately: wash skin with soap And water and change clothing if possible.	
10. Lewisite	Very persistent.	Smell of geraniums in crude state. Skin stinging. Detectors turn RED where in contact with liquid.	*Liquid.* *Eye.*—Pain, redness, closed in 1 hour, permaneat blindness. *Skin.* — Immediate stinging, redness in 15 minutes, blisters in an hour's time and upwards. If swallowed may cause death.	*Liquid and vapour.* As above.	*Liquid.* As above. *Vapour.* There should be no casualties owing to warning due to smell and irritation.	

APPENDIX B

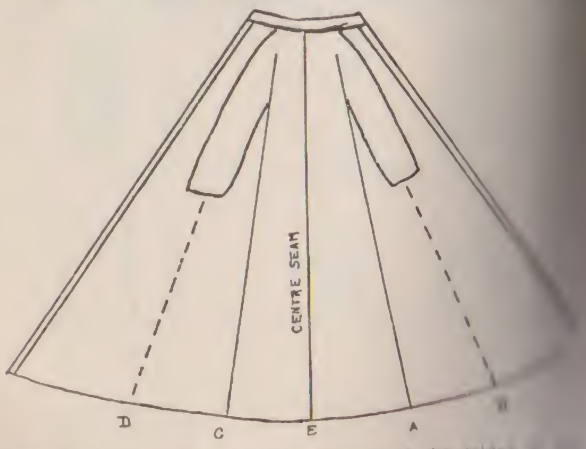
INSTRUCTIONS FOR PUTTING ON THE CAPE, ANTI-GAS, IN THE "ROLLED" POSITION

(NOTE.—Two men are required for this, as it is impossible for the [man] who is actually wearing the cape to tie the tapes behind his back [and] and roll it without assistance.)

1. *To put the cape on.*—Hold cape in front of the body by the [neck] tapes, with sleeves towards the body, and throw it over the shoulders [and] the equipment, so that it hangs loosely down the back. Pass tapes [over] shoulders and under arm-pits and tie them behind the back with an [ordinary] knot. The loose ends now hang down the back. Assistance is [required] for this, and also for the folding and rolling which follows.

2. *To fold the cape.*—To fold and roll the cape, the assistant [stands] behind the wearer.

Hold the centre seam (E) in the left hand, grasp the next seam [(A)] the right with the right hand and bring them together. Hold [these] seams (E and A) in the left hand, fold the remaining portion of the [right] side of the cape in half, and grasp this fold (B) also in the left [hand] that the outside edge of the cape is towards the wearer's right. Repeat the whole of this procedure with the left hand portion of the cape, so that it should now be hanging straight down the wearer's back with edges outside. (It is essential that the edges should be [folded] in order to allow the wearer to draw the cape over his shoulders easily.) The cape should now be from 16 to 18 inches in width from top to [bottom].



NOTES.—1. A, B, C, D are points which must be folded [to] centre seam E.

3. Points B and D are approximately half-way between seams A and C and the edges of the cape.

4. *To roll the cape.*—Starting at the bottom, roll the cape up tightly until it rests on the nape of the wearer's neck, pass one tape over each shoulder, and pass the left tape through the link on the respirator haversack (at where the sling and haversack join), and fasten it to the right tape by tying a bow.

The cape is now in the "rolled" position.

5. *To obtain protection.*—Undo the bow by pulling one of the tapes. The cape will then fall down the back and can be drawn round the body.

APPENDIX C

TESTS OF ELEMENTARY TRAINING

General

2. The objects of the Tests of Elementary Training are as follows:—

(1) To ensure that recruits have reached an efficient standard.

(2) To ensure that trained soldiers retain their efficiency.

(3) To prevent any detail of elementary training being overlooked, while avoiding unnecessary repetition.

(4) To enable officers charged with the preparation of individual training programmes to see in which subjects further instruction is required, and so to make the best use of the time available.

3. A record of the results of tests will be kept by sub-unit commanders showing the dates on which tests were carried out. Extracts from the records of these lists will always be furnished by the commander concerned when a soldier is transferred from one sub-unit to another.

4. It is important that teaching should not be confused with testing. In training the men are instructed by explanation and demonstration followed by execution, while in the latter men are questioned or ordered to carry out a certain test without any demonstration or assistance.

They must then pass or be put back for further instruction. The conditions of each test will be explained to individuals or squads before it is carried out.

5. Tests are divided into:—

(1) Oral tests.

(2) Execution tests.

(3) Combined tests.

Oral Tests

6. *Care and simple cleaning of the respirator.*—Questions should be put to each man.

7. *Construction of the respirator.*—Questions should deal with the common faults likely to occur in the respirator and haversack, and the effects of these on the efficiency of the respirator.

8. *General knowledge.*—Each man should be tested in his knowledge of the following subjects:—

(1) Gases—their characteristics and how to recognize their effects on the body.

ii. Simple first aid for gas casualties.
iii. Duties of a sentry when he detects the presence of gas.
iv. Action to be taken on hearing the various gas alarms.
v. Action to be taken when gas in any form is encountered.

4. *Qualifying standard.*—Three out of four questions should normally be required to be answered correctly.

Inspection Tests

(For tests 1 and 2 see Respirator Drill)

1. *Adjustment of the respirator.*—Men will be tested in their ability to adopt correctly the following positions:—

i. Slung.
ii. Gas alert.
iii. Alternative gas alert.
iv. Removal and return of facepiece to haversack.

No time limit.

2. *Tests for gas.*—Men will be tested to see whether they can test for gas correctly before removing their facepiece.

No time limit.

3. *Cape drill.*—Men will be tested in their ability to adjust the cape to the "worn", "alert", and "rolled" positions.

No time limit.

4. *Personal decontamination.*—Men will be tested to see whether they can carry out the correct action, as indicated by the size of the [illegible] their individual detectors.

No time limit.

5. *Qualifying standard.*—Men who make serious faults in [illegible] above tests will fail.

Standard Tests

(For tests 1 and 2 see Respirator Drill)

1. *"Gas" from the "alert".*—Men will be tested in the standing, kneeling, and prone positions.

Standard time, 9 seconds.

2. *"Gas" from the "slung" or "carry" positions.*—Men will be tested in the standing position.

Standard time, 11 seconds.

NOTE.—This time does not include the adjustment of the [illegible]

3. To obtain protection with the cape from the "alert" [illegible] positions. (Sec. 29 and Appendix B.)

Standard time, 4 seconds.

4. *Notes.*

i. Men will wear battle order, eye-shields, and steel helmet.
ii. Times stated do not include the subsequent adjustment of the steel helmet, consequent upon the wearing of the [illegible]

Cape, anti-gas, in the "worn" position (N.B.—The front is fastened back for marching.)

Cape, anti-gas, in the "alert" position

Cape, anti-gas, in the "rolled" position

PLATE VII

AIRCRAFT SPRAY ON DETECTOR, GAS, INDIVIDUAL

(NOTE.—The spots are RED on the detector.)

Fig. I. 3·0 *mm. drops.*

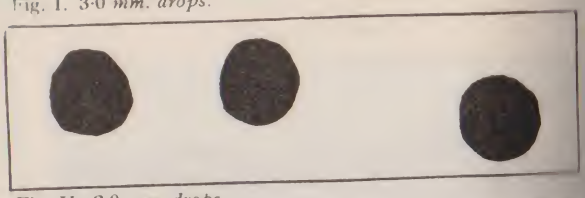


Fig. II. 2·0 *mm. drops.*

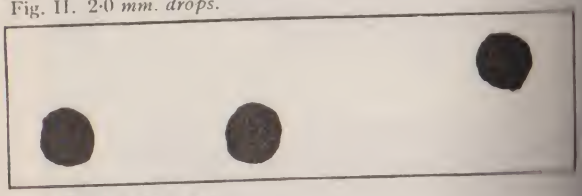


Fig. III. 1·0 *mm. drops.*

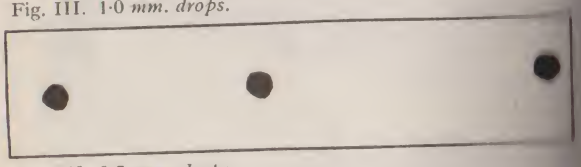
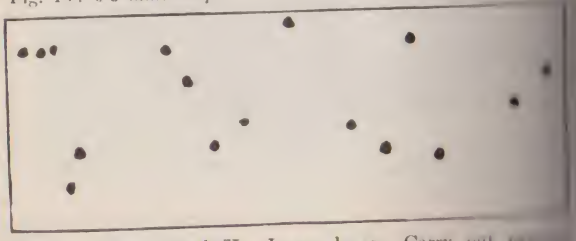


Fig. IV. 0·5 *mm. drops.*



NOTES.—Figs. I and II. Large drops. Carry out [illegible] decontamination as described in Sec. **26,** 1, i.

Figs. III and IV. Small drops. Carry out [illegible] decontamination as described in Sec. **26,** 1, ii.

(N.B.—Fig. II demonstrates the minimum size of "[illegible] drops".)

CHAPTER FIFTEEN

RESPIRATORS

1. Description

P.A.G. and A.R., Pamphlet No. 2, Respirators

1. *Facepiece, Mark V (see Fig. 3).*

This facepiece is made of rubber without a fabric covering. The head harness buckles are riveted in position. It has a slight depression in the region of the temple and has a microphone mounting on the left side to take a microphone adapter. The microphone adapter mounting is normally closed. If required for use with microphone, the rubber closing disc is punched out and the microphone adapter assembled and secured by the appropriate clip. When the facepiece is no longer required with the microphone, the adapter is removed and the hole closed with a plug and clip issued for the purpose. In other respects the facepiece is similar to the Mark IV, later issues. This facepiece may be issued to all personnel including those wearing spectacles who require a normal size facepiece.

2. *Head harness No. 4, Marks I and II,* consists of four elastic bands ¾-inch in width stitched to a canvas head pad to form six ends for attaching to the facepiece buckles. The whole head harness has to be discarded if one band is defective.

Head harness No. 4, Mark III, consists of three elastic bands ¾-inch wide each 18 inches long, threaded through slots in a rubber head pad to form six ends for attaching to the facepiece buckles. Individual elastic bands can be replaced as they become defective. This mark of head harness No. 4 should be fitted when replacement is necessary to all Mark IV type and Mark V facepieces.

3. *Container, Type E.*

The Type E container has charcoal and a special filter for poison smokes, the arrangement is different from that of type D. The air enters through two slots in the side of the container; when in the haversack, these slots should face the central partition. The inlet valve consists of a small metal disc hinged on a wire frame, fixed in the neck of the container. On no account will this inlet valve be removed. This type of container gives complete protection against all war gases.

4. *The Respirator Haversack, Mark V.*

The haversack is made of waterproofed canvas and is divided into three compartments, one for the facepiece, one for the container and the third for gas equipment. The anti-dimming outfit is carried in a canvas bag in the bottom of the facepiece compartment. In the bottom of the haversack, vents are provided to prevent the collection of water in the haversack, and in the bottom of the container compartment is a wire platform. This platform is required for Type A containers. The sling is adjustable for length by means of two brass slides,

and one end is secured to the right-hand side of the haversack by a "D" loop. The other end is provided with a spring hook which can be secured to:—

i. large "D" loop on the top left-hand corner of the haversack—for dismounted troops;

ii. a small "D" loop on the left-hand side of the haversack—for mounted troops.

The sling has an eyeletted canvas tab and a whipcord loop, and to the large "D" loop at the left-hand top corner of the haversack an "S" hook is provided. The haversack is provided with a yard of whipcord fastened to the top right-hand corner and a small "D" loop on the right-hand side for the purpose of securing the haversack to the body when the respirator is carried in the "alert" position.

5. *The outfit, anti-dimming.*

The respirator facepiece is designed so that the dry air breathed in passes over the inner surfaces of the eyepieces. This reduces the amount of moisture which condenses on them on breathing out, but it does not entirely remove the condensation, except in the most favourable conditions. Anti-dimming compound is therefore applied to the insides of the eyepieces to cause the moisture to form a clear film which does not interfere with vision. The correct application of anti-dimming compound is an important part of the respirator drill and careful attention must be paid to it.

There are three Marks of anti-dimming outfit, *i.e.* Marks III, IV and V.

i. The outfit, Mark III, has the compound contained in a metal cup to the bottom of which a piece of cloth is attached, the whole being enclosed in a cylindrical metal box, with a screwed cap.

ii. The outfits, Marks IV and V, consist in each case of a cylindrical metal box with two screwed caps; in one end of the box the compound is contained in a metal cup whilst the other end of the box contains the cloth. For convenience of identification the end of the box containing the compound is coloured red in the Mark V and in the later issues of Mark IV.

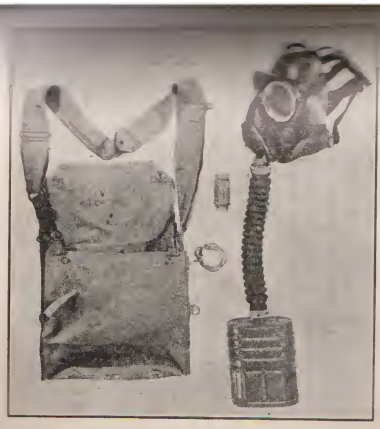
iii. The methods of application of the different Marks of anti-dimming compound are printed on the various boxes, but the method recommended for all outfits is that printed on the outfit Mark V and is as follows:—

Clean the eyepiece with the cloth provided. Breathe on the eyepiece and apply a little compound evenly with the finger. Breathe on the eyepiece again and polish *very lightly* with the cloth so that a thin, even film of the compound remains.

iv. One anti-dimming outfit is supplied with each respirator; spare outfits may be obtained as required.

6. *The working of the respirator.*

i. When the respirator is not in use or when the wearer holds his breath both inlet and outlet valves are closed.



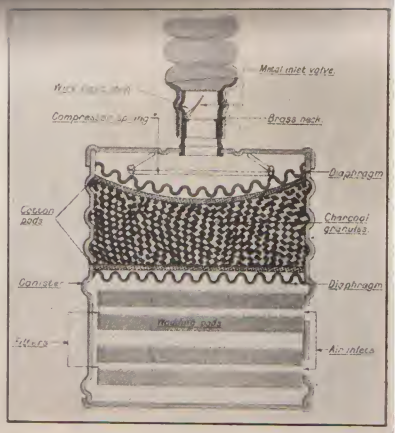


FIG. 3.—SERVICE RESPIRATOR

Facepiece, Mark V. Container, Type E.
Haversack, Mark V. Anti-dimming outfit.

The action of breathing in pulls the inlet valve off its seating so air enters the container, the outlet valve meanwhile remains shut so that no air can enter by this means.

ii. (*a*) In the type A container, on entering the air is drawn through the charcoal, which absorbs all war gases other than nose gases.

(*b*) After air has entered the types D, E, and F containers it also passes through the particulate filter, which absorbs all finely divided smokes such as nose gases, then through the activated charcoal, which absorbs other war gases.

iii. From the container the air is drawn through the connecting tube and up the air passage opening into the inside of the facepiece.

iv. The air is drawn up the corrugated tube, thence through the [illegible] channels and so to the opening inside the facepiece.

v. The action of breathing out forces the inlet valve against its seating and expired air cannot pass through the container.

vi. At the same time the action of breathing out pushes the [illegible] of the outlet valve rubber of the Mark IV and V facepieces away from its seating; the air breathed out then escapes through the outlet valve.

2. Fitting

1. *General.*

i. To ensure complete protection against gas, correct fitting of the facepiece is of paramount importance.

ii. The aims of fitting are:—

(*a*) to provide efficient protection;

(*b*) to give comfort when the respirator is worn for long periods;

(*c*) to ensure that the wearer's efficiency is reduced as little as possible.

iii. Facepieces are made in three sizes—small, normal and large. Approximately 90 per cent can be fitted with normal size respirators.

iv. The elastic head harness serves to hold the respirator against the face and each elastic band can be adjusted to suit the individual.

v. Fitting consists of:—

(*a*) Selecting the correct size for the wearer's face.

(*b*) Adjusting the elastic bands of the head harness so that the respirator is comfortable and stable on the face. The facepiece of the respirator is made of soft and flexible rubber so that it will naturally tend to shape itself to the face and make close contact with the skin without using strong pressure. If the elastic bands are drawn too tight, they may cause leakage by stretching the rubber and so prevent it from taking the shape of the face. The head harness should therefore not be tighter than is necessary to hold the facepiece firmly on the face without causing discomfort.

vi. Special cases with facial deformities, scars and [illegible] reported through the usual channels.

2. *Method of fitting.*

Stage 1—Preliminary adjustment.

i. Issue a normal size respirator, slacken off all the elastic bands of the head harness, so that the ends are about one inch from the buckles, and then instruct the wearer to put on the respirator.

ii. Tighten each of the elastic bands, so that the facepiece is held firmly but comfortably in contact with the skin, with all the bands exerting an equal pull. *The wearer's chin must fit closely into the chin of the facepiece.*

Stage 2—Examination of size.

Examine whether the size is correct. If the wearer's eyes appear approximately midway between the top and the bottom of the eyepieces, the size is correct.

If the eyes are much *below* the centre of the eyepieces in a normal size, it must be exchanged for a small size; if much *above* the centre of a normal size, a large size is required.

Stage 3—Final adjustment of correct size.

Examine under the chin, then round the cheeks, temples and forehead to ascertain that the facepiece is firmly on the face.

Stage 4—Test for gas tightness.

Close the connecting tube so that no air can be drawn through it. Direct the wearer to attempt to breathe in. If the facepiece is drawn on to the face, and no air can be drawn in round the side of the facepiece, a satisfactory fit has been obtained.

If the wearer can draw air in round the facepiece, further fitting or adjustment is required.

3. *The wearing of spectacles with respirators.*

Personnel who require to wear spectacles with respirators must obtain spectacles with frames of the approved official pattern; these are made of metal with flattened side members. No other pattern will be worn when using the respirator.

The spectacles will be fitted from an ocular point of view by the medical officer or eye specialist in the normal way, particular care being taken that the lenses are as near as possible to the eyes of the wearer.

Fitting of the spectacles for gas tightness when a respirator is worn and making of any minor adjustments will be carried out by the unit M.O., who will pay particular attention to the following points:—

(a) Only facepieces, Mark IV Special T, Mark IV Special T, MIC. or Mark V, will be worn with spectacles.

(b) The flattened side members should lie in light contact with the skin of the face, particularly near the eyes; where necessary, they should be bent to ensure this.

(c) Spectacles, when worn with respirators, should be treated with anti-fog compound on both sides of the glasses.

CHAPTER SIXTEEN

RESPIRATOR LESSONS FOR RECRUITS, AND RESPIRATOR DRILL

RESPIRATOR LESSONS FOR RECRUITS

Lesson 1. Recruits' initial lesson

To be taught immediately recruits have received their respirators.

1. Preliminaries.—Squad seated round a table with respirators; instructor has with him various types of facepieces and all types of containers available, and one respirator diagram.

2. State object of lesson.—To teach the parts of the respirator and how it works.

3. Name and demonstrate the parts of the respirator:—

i. The facepiece, Mks. IV and V; head harness, eye-pieces, all passages, valve holder and connecting tube.

ii. Containers, Types available; inlet valve, charcoal filling; (not type A).

iii. Haversack, Mark V and VI; components, wire platform, slides, flat spring hook, whipcord, brass "Ds" and "S" hooks.

iv. Anti-dimming outfit; cylinder, composition and cloth.

4. Explain the circulation of the air through the respirator, the of the valves; the trapping of the poison gas and the protection to eyes and lungs; the object and method of operation of the anti-dim compound.

5. Demonstrate the correct way of carrying the respirator in the sack; squad imitates.

6. Instructor interrogates squad.

Lesson 2. Care and cleaning

1. Preliminaries:—

i. Squad seated on forms with respirators.

ii. Instructor has with him: a complete respirator; a damaged piece; a damaged container; Mills equipment cleaner, Pickerings equipment cleaner, khaki colour.

2. State object of lesson.—To teach the recruit how to maintain the respirator in a serviceable condition.

3. Demonstrate the causes of damage and explain how they may be prevented, e.g.:—

i. The facepiece.—Elastics, their misuse. Buckles should not be put to undue strain. Outlet valve guard retain nut should not be tampered with. Eyepieces can only be damaged through gross carelessness. Fabric, adhesive tape prevents wire rusting tube. Distortion caused by incorrect folding and by prolonged storage in haversack; facepieces should be worn at least once a month.

ii. The container.—Rough usage, water entering.

iii. Haversacks.—Do not scrub, designed to carry only respirator, anti-dimming outfit and other authorized anti-gas equipment, *e.g.* eyeshields and ointment.

iv. The respirator will be kept in a cool, dry and, if possible, dark place.

4. Cleaning after use:—

i. Wipe the inside of the facepiece with a dry cloth, treat eyepieces with anti-dimming compound, and replace in the haversack.

ii. If the facepiece and elastics are wet and muddy, allow them to dry and brush off mud lightly before replacing in the haversack.

iii. If the haversack is wet and muddy, allow to dry and then brush off the mud lightly. Explain that the haversack is waterproofed and can only be cleaned with Mills equipment cleaner, No. 700, or Pickerings equipment cleaner, khaki colour.

5. Instructor finally explains that in hot weather, etc., some discomfort may be caused by the accumulation of condensed breath round the chin inside the facepiece.

This condition will increase, rather than diminish, the protection afforded by the facepiece, but the moisture can be removed by bending forward until the wearer is looking vertically downwards. The liquid will then run into the expiratory vent and can be blown out through the outlet valve.

6. Instructor interrogates squad.

RESPIRATOR DRILL

Lesson I—The slung position

1. *Object and use.*—To teach the slung position.

2. This is the normal position when gas is not likely to be encountered.

3. The respirator, when slung, should be the last item of equipment to be put on.

4. *Demonstration.*—On the command "Slung position," place the sling over the right shoulder, haversack on the left side—press buttons closed and tuck to the body.

Lesson II—The gas alert position

1. *Object and use.*—To teach the gas alert position.

2. This is the normal position when gases are likely to be encountered and the respirator is put on before the equipment.

2. *Demonstration.*—On the command "Gas alert," hold the haversack in front of the body with press buttons inwards. Place the sling over the head.

Undo the press buttons with a sharp pull.

Withdraw the whipcord with the right hand, pass it through the "D" on the right of the haversack.

Raise the haversack on to the chest.

Allow the sling to fall down the back and hold the sling with the left hand.

Pass the whipcord round the body clear of all hooks, through the sling fasten tightly to the "D" on the left side with a slip knot.

Fold over the flap between the haversack and the body.

Lesson III—The alternative gas alert position

1. *Object and use.*—To teach the alternative gas alert position.

This position is adopted when coming to the "alert" from the "sling" position when gases are likely to be encountered.

2. *Demonstration.*—On the command "Alternative gas alert," slip the left arm through the sling of the haversack and bring it to the front of the body.

Undo the press buttons with a sharp pull.

Withdraw the whipcord with the right hand, pass it through the "D" on the right of the haversack.

When wearing the Mark V, Vc, or VI haversack, seize the "S" hook with the right hand and the eyeleted canvas with the left hand, and fasten them together.

Pass the whipcord round the body clear of all hooks and fasten the sling to the "D" on the left with a slip knot.

Fold over the flap between the haversack and the body.

Lesson IV—The gas position from the gas alert or alternative gas alert

1. *Object and use.*—To teach gas position from gas alert.

This position is adopted when gas is encountered.

2. *Demonstration.*—On the command, "Gas" hold the breath.

Place the chinstrap under the chin with the right hand, at the same time place the steel helmet at the back of the head with the left hand.

Open the haversack flap.

Seize the facepiece by the valve holder with the right hand and take it quickly out of the haversack.

If eyeshields are being worn they must be removed.

Hold the facepiece in front of the face, the thumbs under the lower elastic bands and the palms of the hands facing inwards.

Bring the facepiece towards the face, dig the chin in. (The instructor now drops the facepiece but continues to demonstrate with movements.)

Bring the elastic bands over the head so that the centre [illegible] approximately horizontal.

Run the finger round the facepiece and over the elastic bands to ensure the edges are not folded over nor the elastics twisted.

Correct any fault in adjustment and breathe out hard. Replace the steel helmet and adjust the chin strap.

(The instructor now demonstrates this with a facepiece.)

NOTES.—i. After demonstration the instructor will bring out the necessity to hold the breath until the respirator is adjusted, so that no gas is breathed in, and point out the importance of breathing out to clear gas from the facepiece.

ii. As the lesson "Removal and return of facepiece to the haversack" is not taught until later in the sequence of lessons, instructors must show the squad how to remove the facepiece correctly so that damage may be avoided.

LESSON V—THE GAS POSITION FROM THE SLUNG

1. *Object and use.*—To teach the gas position from the slung.

This method of adjusting the respirator is adopted in case of unexpected gas attacks. Protection must be obtained at once; the haversack can be adjusted later.

2. *Demonstration.* (The instructor does not demonstrate until all detail has been given.)

On the command "Gas," hold the breadth. Slip the left arm through the sling and bring the haversack to the front of the body.

Undo the press buttons with a sharp pull.

Adjust the facepiece as already taught.

After protection has been obtained, adjust the haversack in the alternative alert position.

(The instructor now gives a complete demonstration, starting from the alert position.)

LESSON VI—TEST FOR GAS

1. *Object and use.*—To teach how to test for gas.

At all times before removing the facepiece, each individual must test for gas to ensure that no gas is present.

2. *Demonstration.* (The instructor tells the squad to imagine that his facepiece is adjusted. He then demonstrates with motions.)

On the command "Test for gas," take a deep breath, insert two fingers of the hand between the facepiece and the cheek and between the lower elastics—Sniff gently.

If gas is present, withdraw the fingers and breathe out hard.

(The instructor now gives a complete demonstration wearing a facepiece.)

NOTES.—i. After demonstration the instructor emphasizes that, before testing, a deep breath must be taken to prevent gas entering the lungs, and, if coughing, if gas is found, the man must breathe out hard to clear the facepiece of any gas.

3. *Practice.* (The instructor does not wear a facepiece but goes through

LESSON VII—REMOVAL AND RETURN OF FACEPIECE TO HAVERSACK

1. *Object and use.*—To teach how to remove and return the facepiece to the haversack.

2. *Demonstration.* (The instructor tells the squad to imagine that the facepiece is adjusted. He then demonstrates with motions.)

On the command "Remove and return facepieces," with the left hand place the steel helmet at the back of the head, insert two fingers of the right hand between the chin and the facepiece and remove the facepiece with an upward movement.

If it is necessary to wear an eyeshield, one should now be adjusted.

Replace the steel helmet and adjust the chin strap.

(The instructor now puts on a facepiece and demonstrates. He then continues as follows, demonstrating as he teaches.)

Hold the facepiece in the right hand.

Place the elastics inside.

With the left hand fold in the forehead portion so that it separates the eyepieces.

Replace in the haversack, harness buckles to the wearer's right.

Fold over the flap between the haversack and the body.

NOTE.—After demonstration the instructor will bring out the device for folding the facepiece in a correct manner in order to protect the eyepieces and prevent a channel forming in the facepiece.

PART FIVE

ORGANIZATION AND TACTICAL TRAINING

		Page
Chapter	XVII—Infantry Organization	143
"	XVIII—Tactical Training	149
"	XIX—Infantry and Supporting Weapons	154
"	XX—Elementary Tactics	170

CHAPTER SEVENTEEN

INFANTRY ORGANIZATION

Military Training Pamphlet No. 39, 1940. Infantry Section Leading. Infantry Training

1. The Battalion

1. The battalion consists of headquarters, headquarter company, and 4 companies each of 3 platoons each of 3 sections.

2. Included in battalion headquarters is the intelligence section of 1 officer, 1 sergeant and 6 men.

3. On the strength of headquarter company there are:—

No. 1 (Signal) platoon.
No. 2 platoon—4 L.M.Gs. for A.A. and ground defence.
No. 3 platoon—two 3-in. mortars.
No. 4 (Carrier) platoon—10 Bren carriers organized as headquarters and 3 sections each of 3 carriers. Weapons—1 Bren per carrier and 1 anti-tank rifle per section of 3 carriers.
No. 5 (Pioneer) platoon.
No. 6 (Administrative) platoon.

Each company has four 15-cwt. trucks, one for each platoon and one company headquarters. In addition there is one 8-cwt. truck for company headquarters.

Weapons comprise one rifle and bayonet per man, 1 Bren per section, 2 in. mortar and 1 anti-tank rifle per platoon. In each platoon headquarters there are two men for the carriage of the mortar and its ammunition.

4. The number of platoons has been decreased from 4 to 3 to give the company commander greater control. For a similar reason there are only 3 sections in the platoon.

2. The Signal Platoon

1. The signal platoon provides the means of intercommunication from battalion headquarters to:—

i. Headquarters of companies and the mortar platoon.
ii. Supporting machine guns and artillery.
iii. Battalion on left.
iv. Special detachments within the battalion, i.e., battalion intelligence O.P. if required.

3. The Anti-Aircraft Platoon

The A.A. platoon consists of 4 Bren L.M.Gs., each carried complete with its detachment in a 15-cwt. truck. The trucks are fitted with a central "Motley" A.A. mounting and carry also an anti-tank rifle.

The platoon commander, and one other rank for intercommunication within the platoon, ride motor cycles.

The platoon is intended for the air or ground defence of battalion headquarters or generally as a mobile reserve.

4. The Mortar Platoon

1. The mortar platoon is a reserve in the hands of the commanding officer for allotment where additional fire power is required. The five mortars can operate separately.

In attack, mortars may be placed under the orders of forward companies or retained to support action by the battalion reserve. Their role will be to work well forward and engage targets beyond the range of the 2-in. mortar, or which require greater weight of shell, in conditions where fire and accurate artillery support is impossible.

In defence its main role is to support counter-attacks of all sorts. It may be used for harassing fire, if sited well forward and with alternative positions; or for denying some particular piece of ground which cannot be covered by the fire of other weapons.

5. The Carrier Platoon

1. It is bullet proof against rifle fire on the same level, but the crew is vulnerable to fire from above, or when the carrier is on a steep slope. It is, therefore, a partially protected vehicle only.

2. It can move fast across good country, but will be stopped by trenches, by any obstacle which is a tank obstacle, and by many which are not. There will be occasions, therefore, when it will be useful to follow tanks forward. Good ground scouting will always be necessary.

3. The L.M.G. detachment, consisting of two men, cannot be trusted to do more than keep the gun in action, either in the vehicle or on the ground. Once in action the detachment has little or no power to protect itself by observation, and is, therefore, very vulnerable to a move round by one or two determined infantrymen. If an isolated position has to be held for any length of time the three detachments in a section must be sited to provide mutual support.

Carriers cannot carry out mopping-up operations.

4. The period of dismounting from the carrier and getting into action is one of considerable danger to personnel and vehicle. Dismounting must be carried out under cover and very quickly. The carrier, once the L.M.G. is dismounted, is entirely vulnerable, and must either withdraw to the cover of other troops or must be concealed close to the L.M.G. and under cover.

5. The fire power of the carrier platoon is considerable, and the platoon should for short periods be able to hold a front varying from 500 yards to 1,000 yards according to the depth in which it is disposed. But as shown above, gun detachments are very vulnerable unless protected from flank and rear.

6. The L.M.G. can give as effective fire from 400 yards as from closer in. There is no need to move close in to a target to gain fire effect.

7. From these characteristics the tactical employment of the carrier may be deduced. It must be remembered that the carrier is not a light tank; it is an armoured machine designed to convey the L.M.G. from place to place and from which the L.M.G. can be fired if necessary.

6. The Pioneer Platoon

1. The pioneer platoon will be specially trained in the following duties:—

(a) *Anti-gas duties, including—*

Anti-gas reconnaissance and marking.
The fencing off of small contaminated areas.
The laying of an improvised surface of timber, brushwood, etc., on contaminated tracks within the battalion area.
Gas-proofing of rooms.
Constructing and operating a field gas-cleansing centre, when necessary.

N.B.—Decontamination of vehicles is the responsibility of drivers.

(b) *Field defences.*—Work requiring some degree of trade skill or handiness with tools, such as—

Revetting.
Loopholes for sentries and snipers.
Improving buildings for defence.
Simple splinter-proof and weather-proof shelters.
Construction of concertinas and knife-rests.
Gas-proofing of dug-outs, fixing gas curtains.
Repair and sharpening of tools.

(c) *Obstacles—*

Removal of obstacles.
The construction of A.F.V. obstacles of a solid nature, requiring the use of tools, either alone or with assistance from rifle companies.
Conversion of partial into complete obstacles.
The handling of ground bombs.

iv. *Camp services*—

Temporary sanitary arrangements, covers for cooking (for protection against spray), etc.

v. *Anti-tank mines*—

Personnel of pioneer platoons will be so trained that they are able to supervise the arming, fusing and laying of anti-tank mines by the remaining personnel of their battalions.

7. The Administrative Platoon

The administrative platoon consists of the quartermaster, transport officer, armourers, fitters, storemen and personnel for officers' mess and water and sanitary duties. All are carried in M.T. Stores carried include reserve ammunition, clothing and anti-gas capes, petrol and miscellaneous technical stores.

8. The Rifle Company

(This section must be read in conjunction with those chapters of Infantry Training, 1937, which deal with the rifle company in the various types of operation.)

1. The platoon is the unit on which infantry tactics are based. If infantry are to be able to fight their way forward, largely with their own fire power, this will demand of the troops skill in the use of ground and a correct appreciation of how to apply all the available fire power to penetrate between the localities held by the enemy and so force him to surrender. During the advance, sections must be equally prepared to assist each other or to use their fire power to assist their own advance. Sections must not become split up and so out of their commander's control.

It must be very clearly understood that the task of the section is to get on to its own objective, and that although it may have to take up a fire position, such position is only a temporary one taken up merely as opportunity to advance occurs or until the fire of the light machine gun is no longer required in the task it is performing.

The 2-in. mortar is immediately available under the hand of the platoon commander and replaces the rifle grenade. Its range is up to 500 yards, and it throws a 2-lb bomb. The H.E. effect is double that of the Mills grenade, and the smoke bomb produces an extremely useful local smoke screen.

2. In defence immediate and co-ordinated arrangements must be made for the siting of L.M.Gs. so that mutual support of defended localities is ensured and the position made ready to repel a sudden attack. Consolidation after an attack is also merely a form of defence to which the above principles equally apply.

The defensive wire in front of every forward post must be covered by the fixed line or arc of a neighbouring post. All fire directed on the obstacles so as to prevent the enemy cutting or penetrating them must be aimed at the bottom of the wire.

Light machine guns on flanking tasks must be protected from close attack. The riflemen of their own sections not required for magazine filling are responsible for this protection.

3. The platoon commander must site his section posts so as to fulfil the requirements of his company commander's orders; he must be prepared in order to obtain enfilade and defilade to site his sections fairly far apart, but he must ensure that he can keep control, i.e. that he can reach his sections during battle without undue exposure.

The anti-tank rifle will be sited in each platoon to cover the most likely approach to the platoon area. In exceptional circumstances the three rifles may be grouped under the company commander for a special task.

4. **The platoon.**—Each platoon consists of:—

Platoon H.Q. and 3 sections.

Platoon headquarters: Commander.
Sergeant.
One orderly.
Batman (in platoons commanded by an officer).
2-in. mortar personnel (2 men).

5. **The section.**—Each section consists of:—

N.C.O. section commander and 10 privates.

6. **Section equipment.**—All carry 50 rounds S.A.A. in pouches. All save rifles with the exception of the man carrying the L.M.G. Magazines will be carried as ordered by the section commander.

The above is the normal allotment of equipment which may be varied according to circumstances, but everyone in the section must be trained to use the light machine gun and anti-tank rifle.

No spare barrel will be carried with the gun during movement. In defence, if the light machine gun is required to fire on fixed lines the tripod mounting must be used. One man will be responsible for erecting the tripod. In defence he will carry a spare barrel and will assist the firer to keep the gun in action.

7. **Personal equipment.**—Each man has a haversack and pack.

The *haversack* will be worn on the back and should normally contain:—

Water bottle.
Mess tin.
Emergency ration.
Knife, fork and spoon.
Cardigan (when not worn).
Waterproof sheet or cape anti-gas under the flap of the haversack.

The *pack* will usually be carried on the platoon truck and will contain:—

1 pr. socks.
Cap comforter.
Soft cap.
Holdall.
Soap.
Towel.
1 pr. laces.
Greatcoat.
Housewife.

8. **Motor transport.**—Each platoon has its own 15-cwt. four-wheel truck, and is therefore a self-contained, tactical unit, complete with weapons, ammunition and tools.

NOTE

The foregoing is the abstract framework of an infantry (rifle) battalion. Esprit de corps, however, is not built on a paper schedule, but on a living organization. Just as no two rifles shoot exactly alike, so no two infantry units are exactly alike in background, tradition and equipment. Every soldier, therefore, should study as well the general history and achievements of his particular unit, in order that he may not only be proud to belong to it, but be able to advance reasons for that which specially commands his regimental loyalty.

CHAPTER EIGHTEEN

TACTICAL TRAINING

Infantry Section Leading. Infantry Training. Military Training Pamphlet No. 23, Pt. I. Field Service Regs., Vol. II

GENERAL PRINCIPLES

1. The Eight Principles of War

1. *Maintenance of the object.* In any operation, great or small, it is the duty of every commander, *whatever the size of his command,* to define clearly to himself the object which he seeks to attain and thereafter to allow nothing to distract him from it.

2. *Concentration.* This principle involves the employment of all available means, physical, moral and material on the task in hand and at the decisive place and time.

3. *Economy of force.* Economy of force is a corollary of concentration, for the latter can only be obtained where and when required if the strictest economy is practised in the allotment of resources to those areas where a decision is not at the moment sought.

4. *Offensive action.* The ultimate overthrow of the enemy demands offensive action. A successful defensive may wear the enemy down but, unless followed by offensive action, it can only result at the best in a stalemate. The offensive gives moral superiority, and tends to confer the initiative and with it liberty of action.

5. *Surprise.* Surprise is the most powerful and effective weapon in war. To surprise the enemy is often a decisive means of achieving victory.

6. *Security.* Success in war can only be obtained if liberty of action is preserved. Security consists in making provision against enemy action which may prejudice the liberty of action of the force.

7. *Co-operation.* It is only by the *active co-operation of all the components of a force* that its full strength can be developed.

8. *Mobility.* To enable a force to be concentrated or dispersed, to gain surprise, to provide security and to assume the offensive, mobility is essential.

2. Tactics

Tactics are the methods of employing military forces in battle in accordance with the principles of war.

Fire dominates the battle-field. Fire is the chief antagonist of movement. To retain the power of mobility, it is necessary to overcome the enemy's fire. The use of ground or darkness or smoke are all means to the attainment of this object, but in the end it will nearly always be necessary to neutralize the enemy's fire producing weapons by the application of a superior fire.

3. The application of the principles of *concentration* entails concentration of will power, of effort and of fire and usually of troops at the point at which the decision is to be obtained. Concentration of fire can, however, be obtained in many cases while the troops applying the fire remain dispersed.

4. Secrecy ensured by concealing preparations or disguising intentions together with rapidity of execution, are the principal measures whereby *surprise* can be produced. The result of surprise is fleeting; it is therefore essential to take the fullest advantage of its effects while they last.

5. The most important quality of every plan is simplicity. Each plan should be as simple as possible, taking into account the nature of the operation to be undertaken, and should require of the troops the simplest and most straightforward action possible in furtherance of the object of the plan.

3. The Fighting Qualities of the Troops

1. The final test of an army is its fighting spirit, which is its readiness to beat the enemy. The fighting spirit of a formation or unit is founded on the personality of its commander and his powers of leadership. Upon this foundation are developed those moral qualities in the troops themselves which are conveniently grouped under the term morale. In this respect, regimental and corps tradition play an important part.

2. The first step in the training of the soldier is the inculcation of discipline. This is done through the medium of drill, physical training, battle training and the inculcation in the man of pride in his unit and his arm.

Physical training is also valuable for the development of physique and for the attainment of quickness in hand and eye. Mental training is directed towards teaching the soldier to think for himself and to act intelligently in the field when thrown on his own resources.

To give the soldier the self-confidence which is essential, he must be highly skilled in the use of his arms and the equipment which he uses. He must be qualified to give his equipment proper care and maintenance and must realize the necessity for it. He must be so practised that he will instinctively use his weapons to the best advantage.

4. Infantry

1. Besides the ordinary infantry battalions, infantry is organized in pioneer battalions, machine gun battalions, motor battalions and in cyclist battalions.

2. *Infantry must in the end confirm all success in war.* Infantry compels the withdrawal or surrender of the enemy and holds the ground which have been secured, or the points of importance which have been protected, as a base for further action. It is the most adaptable and most generally useful of all arms, since it is capable of operating over ground either by day or night and can find or make cover for itself more readily than the other arms.

5. A List of Military Definitions Pertaining to Infantry

Barrage.—A curtain of fire in front of the infantry. A creeping barrage is one that moves gradually in front of the advancing infantry. A box barrage is one that is put down on the flanks and rear of any area of ground in order to isolate it.

Berm.—The distance between the edge of an excavation and the mound formed of the excavated earth in a defence work.

Blockhouse.—A small shelter made of concrete, wood, or stones, etc.

Bombardment.—A heavy concentration of artillery or mortar fire on defensive positions.

Bound.—A movement from one tactical position to another or the tactical position reached at the end of a movement.

Breastwork.—A defence work of which the greater portion of its height is above ground level.

Camouflage.—Any artificial means employed to deceive the enemy's visual or photographic observation from the ground or from the air.

Column.—Bodies of troops one behind the other at such distance from one another that a wheel of 90 degrees to either flank will bring them into line maintaining the regulation intervals.

Column of route.—A column of fours (or threes) with not more than four (or three) men abreast in any part of the column, including officers and supernumeraries. Column of route is the normal formation for troops marching on a road.

Communications.—Roads, railways, paths, tracks, waterways, sea and air routes.

Connecting file.—A single man or men in pairs specially detailed to keep a detached body in keeping touch with its main body.

Consolidation.—Making captured ground secure against attack by careful reorganization of the troops and by the provision of protection.

Covering.—i. The act of a body placing itself directly in rear of another. ii. The act of a body placing itself in front, on a flank or in rear of another for protective purposes.

iii. The act of protecting or assisting the movement of a body of troops by means such as fire, readiness to fire, etc.

Covering fire.—Fire by units and arms to engage the enemy's attention and force him to seek cover in order that other units or arms may advance unseen.

Deploy, to.—To extend a formation or unit into a more open formation.

Directing battalion (company, platoon, section or file).—The battalion (company, platoon, section or file) responsible for keeping direction in a movement.

Drill.—The training of the soldier to execute certain movements as a disciplined nature.

Enfilade fire.—Fire which sweeps a position or body of troops from a flank.

Field of fire.—The area of ground exposed to the effective fire of a given number of men or group of guns.

Fire control.—The necessary arrangements and orders for hitting the target.

Fire direction.—The term applied to instructions given by the commander of more than one fire unit to the fire unit commanders, as to how their fire is to be applied.

Fire plan.—The arrangements made by a commander to ensure that the fire of all the weapons of which he disposes is co-ordinated and directed in accordance with his intention.

Fire step.—A recess or ledge made or left in the face of a trench so that a man standing on it is enabled to fire over the parapet.

Fire unit.—Any number of men firing by the executive command of one. The section is the normal infantry fire unit.

Flam.—Two strokes on the drum beaten in very quick succession, the second stroke being louder than the first. A double flam is this repeated with a very slight pause between each flam.

Formation, battalion (company, platoon, section or file).—The battalion (company, platoon, section or file) on which a change of formation is based.

Forward slope.—The side of a hill or mound which is towards the enemy. Hence the *reverse slope* is that away from the enemy.

Ground scouts.—Men employed to ascertain whether the ground in the immediate vicinity is passable and to discover the most favourable routes for movement in any direction.

Intercommunication.—The means of transmission of all orders and information by which the close co-operation of all forces in the field is ensured. The means include the service provided by the Corps of Signals, by regimental signallers and orderlies, by liaison officers and by the field postal service.

Interval, deploying.—The lateral space between units in close order or in column, on the same alignment, the space being equal to the frontage of a unit in line.

Liaison.—Means for ensuring co-operation and keeping touch between units or arms.

Mass.—A battalion with its companies in line of close columns of platoons, with five paces interval between companies.

Oblique fire.—Fire which is directed diagonally, roughly halfway between front and flank.

Observation post.—A post from which a particular area can be kept under observation or from which artillery and machine-gun fire can be controlled and corrected.

Orderly.—A man detailed to carry messages.

Parados.—A bank of earth constructed to give protection against fire and the back blast of high-explosive shells, etc.

Parapet.—Earth, etc., banked up in front of a trench above ground level, to afford protection from frontal fire.

Patrols.—*See* Chapter IX of Infantry Training, 1937; or Chapter XX, this pamphlet.

Patrol, standing.—A small party of men under a N.C.O. posted a considerable distance in advance of other troops to watch either the enemy, a route by which he might advance or a locality in which he might attempt to concentrate unseen.

Piquet (tactical).—A self-contained party detached for a definite period from a force for the purpose of carrying out protective duties in the case of warfare against savage or semi-civilized enemies.

Point (with reference to an advanced guard or patrol).—The men moving immediately in advance of a vanguard or patrol.

Position, change of.—A movement by which a body of troops takes up a new alignment.

Reconnaissance.—Examining, exploring and searching the country in order to discover and locate the enemy or to find out the lie of the land.

Reconnoitring detachment.—A party of any size sent out from a force to obtain information.

Rendezvous.—A prearranged place of assembly.

Reverse fire.—Fire directed against the rear of a position.

Revet.—To hold up earth at a steeper slope than its natural slope by artificial means or to strengthen the sides of an excavation by artificial means in order to prevent them falling in.

Sanitation.—The practical application of certain well-established laws with regard to the preservation of health and the prevention of disease.

Scouts.—Men detached to reconnoitre; or individual members of a scout

Section of a trench.—The sectional view of a trench showing breadth, depth and slope of the sides, etc.

Signal centre.—A prearranged position to which reports intended for a commander are to be sent.

Sump.—A hole dug in the ground to collect surface water with a view to allowing it to soak away.

Traverse.—A buttress of earth provided between two adjacent portions of fire or communication trench for protection against enfilade or oblique fire and to localize the effect of shell bursts, etc.

CHAPTER NINETEEN

INFANTRY WEAPONS AND SUPPORTING WEAPONS

Infantry Section Leading, Infantry Training, and M.T. Pamphlet No. [illegible] (Part I), and Supplement, 1939.

INFANTRY WEAPONS AND THEIR CHARACTERISTICS

1. Light Machine Gun

1. The chief characteristic of this weapon is its power of delivering a volume of accurate fire with the employment of few men. It can be fired from bipod mounting, when one man can maintain the gun in action, or from tripod mounting when two men are required. When the tripod mounting is employed the gun can be laid on fixed lines. The term fixed line implies that a weapon is so arranged during daylight that it can by the use of an aiming lamp or mark continue to fire in a certain direction when the aim of the firer is obscured by darkness, etc. When the tripod is in position for fire on a fixed line the gun can be removed and used on the bipod mounting to engage other targets. An extra leg is embodied in the tripod for use as an anti-craft mounting.

2. **Fire effect.**—The gun has two different types of fire:—

i. *By single rounds.*—Full use should be made of the gun's ability to fire single rounds, as by this method it is possible to save ammunition and conceal the presence of the gun until a suitable target appears. Surprise effect can thus be obtained.

ii. *Automatic.*—When employed as an automatic weapon it should be fired in bursts of four to five rounds from the bipod. Bursts of this size avoid over-heating, strain to mechanism and excessive expenditure of ammunition, but at the same time produce a sufficient volume of fire to make observation possible.

It is a very accurate weapon which permits of only a small margin of error in aiming and range estimation.

3. **Ammunition.**—Magazines are carried in pouches attached to equipment. Men should not be required to carry more than [illegible] magazines for long distances.

4. **Anti-aircraft.**—When the light machine gun is fired from the aircraft mounting, two men are required to operate the gun to [illegible]

Section commander	Directs and controls fire.
One man	Fires and maintains gun in action.
One man	Assists the firer to change magazines and keeps the gun supplied with ammunition.

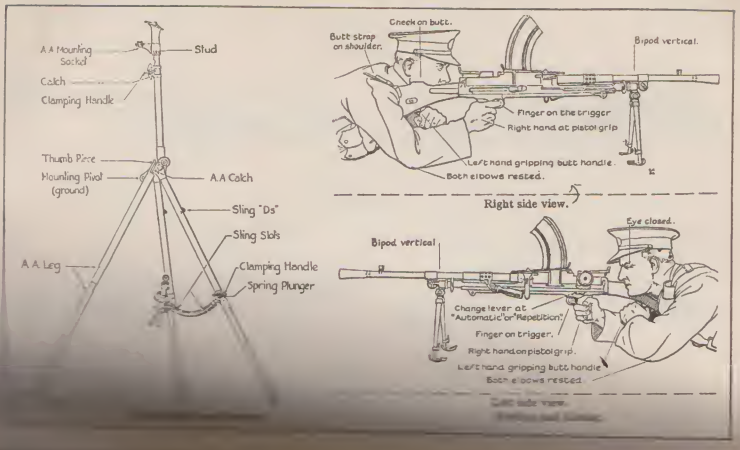
5. **General.**—The light machine gun is the principal [illegible] infantry and, except in cases where the need for extreme [illegible] weighs the need for fire power, it should always be carried [illegible] action. *All ranks must be experts in its use.*

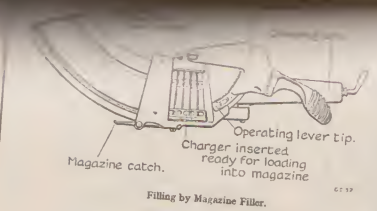
Lewis Gun—Correct Hold

Lewis Gun

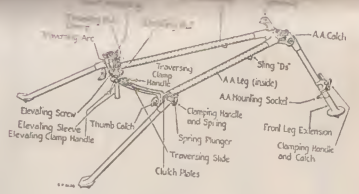
"Change"—1st Phase

"Change"—2nd Phase

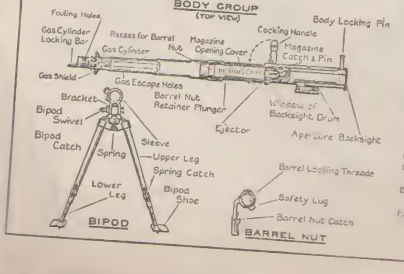


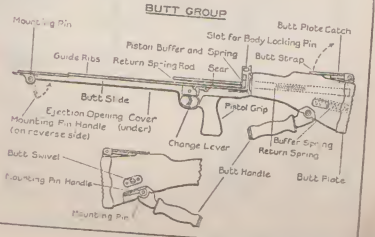


Filling by Magazine Filler.

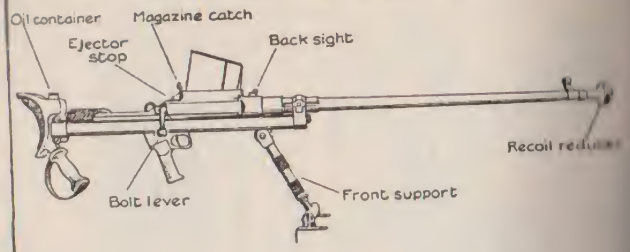


The Tripod (Ground).

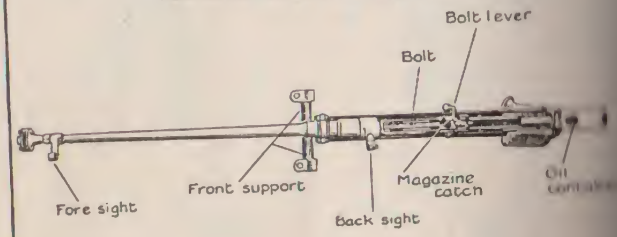




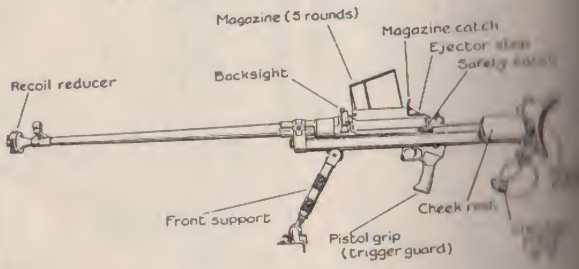
The anti-tank rifle (off-side view)



The anti-tank rifle (top view)



The anti-tank rifle (near-side view)



2. Rifle and Bayonet

1. Accuracy is the chief characteristic of the rifle which will be regarded as the personal protective weapon of the individual.

2. The bayonet is the weapon for hand to hand fighting. Men who are confident with the bayonet, and determined to use it, will always win when fighting gets to close quarters. It is often used at night or by patrols and sentries.

3. Anti-Tank Rifle

1. The anti-tank rifle affords a means of protection against enemy light armoured fighting vehicles. It is a single shot, hand operated weapon. Its chief characterictics are:—

i. Great accuracy and good penetration.
ii. Comparative lightness and mobility.
iii. Pronounced flash and muzzle blast.

The anti-tank rifle is an easy weapon to handle and fire against stationary targets; but for employment against moving targets constant practice and training are required.

2. **Detachment.**—It can be maintained and fired in action by one man, but if the rifle and ammunition have to be carried for any distance they constitute a two-man load.

3. **General.**—The anti-tank rifle is essentially a weapon of surprise and requires careful concealment. It is not, however, a specialist weapon and all ranks must be trained to fire it. It should always accompany the platoon, except at night with a fighting patrol when it may be unnecessary.

4. 2-inch Mortar

1. The 2-inch mortar fires a 2-lb. bomb, either smoke or high explosive. It is chiefly used as a smoke producing weapon for offensive action. It is small and easy to conceal.

2. **Carriage.**—Two men are required to carry it and its ammunition; they can change over loads when required.

3. **General.**—The 2-inch mortar forms a reserve of fire power in the hands of the platoon commander. In attack it will be kept well forward, prepared to come into action at a moment's notice, to assist in maintaining the momentum of the attack, by neutralizing the fire of hostile posts which are holding up the advance of the leading sections. It is of little use at night.

5. H.E. Grenade

1. The grenade can be thrown by hand a distance of 25 to 35 yards. Some fragments may have sufficient velocity to inflict wounds up to 100 yards or more, particularly if the burst is on stony ground. The thrower should therefore be protected from the explosion.

2. Grenades are particularly useful:—

i. In street fighting, for clearing houses, etc.
ii. In uncivilized theatres of war, against an enemy who takes cover in caves or behind rocks, etc.
iii. In trench to trench fighting.

6. Battalion Weapons

In addition to the company weapons mentioned in preceding sections the headquarter company has the following:—

1. **3-inch Mortar platoon.**—The 3-inch mortar fires a 10-lb. bomb which may be either high explosive or smoke. (Battalion total 2 mortars.)

   (*a*) *Carriage.*—Each mortar is carried in a 15-cwt. truck. It may be divided into three loads and be carried for short distances by members of the detachment. Their movement, however, will be slow and the provision of ammunition will be difficult.

   (*b*) *Night firing.*—The mortar can be laid on fixed lines for firing at night, but owing to the varying effect of wind, accurate fire cannot be relied on.

3-inch Mortar

2. **Carrier platoon.**—Its armour, speed and cross-country performance enable it to cross bullet-swept country without undue risk, and it can protect itself against armoured cars with its anti-tank rifles.

   The purpose of the carrier is to move the L.M.G. and crew to a fire position from which the gun can be fired on the enemy.

   The gun will only be fired from the carrier in cases of emergency.

(*a*) In *attack* it is available:—

   (i) In a tank attack to advance rapidly from fire position to fire position to give close support to tanks unaccompanied by infantry.
   (ii) To assist the advance of riflemen by the infiltration method.
   (iii) To protect flanks.

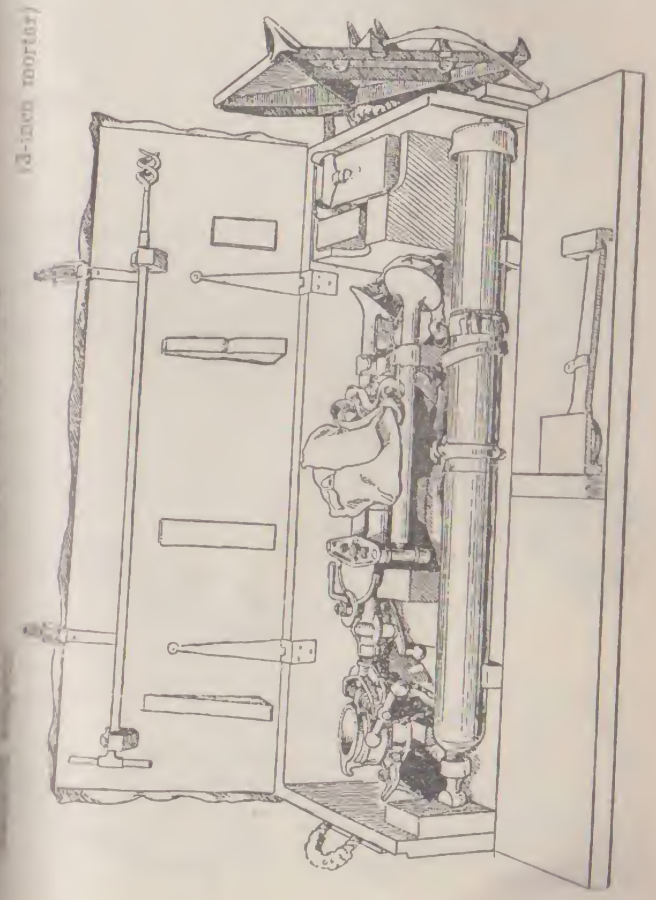
(*b*) In *defence* it will be used:—

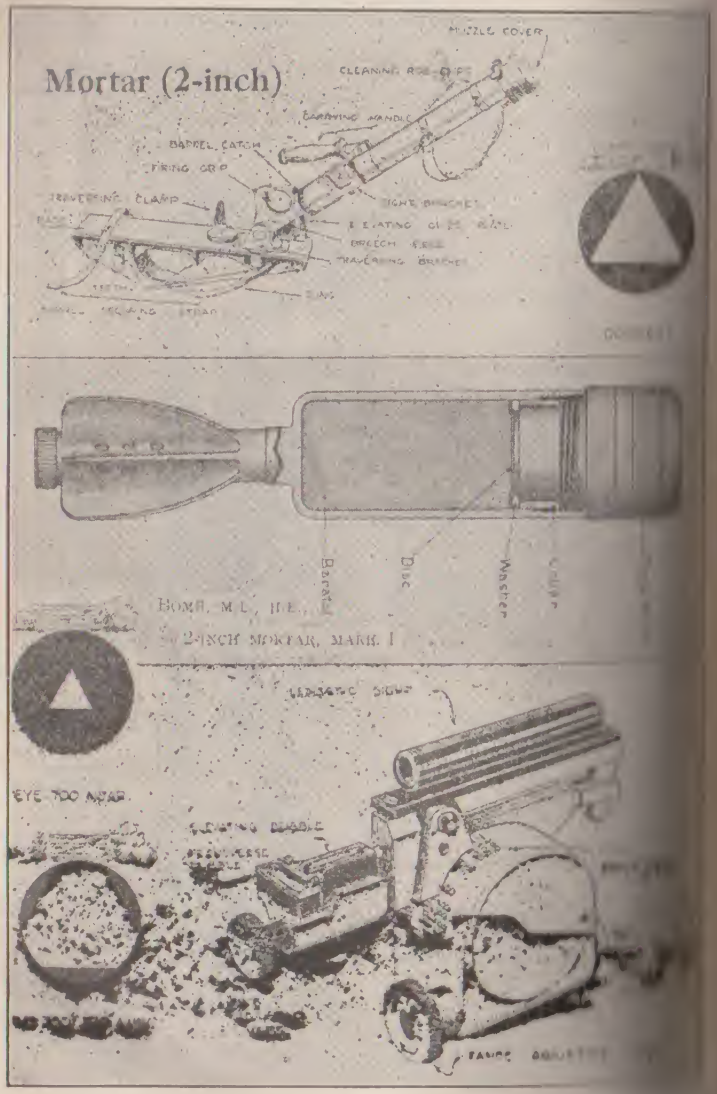
   (i) To move fire power within the position from place to place to produce counter-attack by fire only.
   (ii) To support tank and infantry counter-attacks.

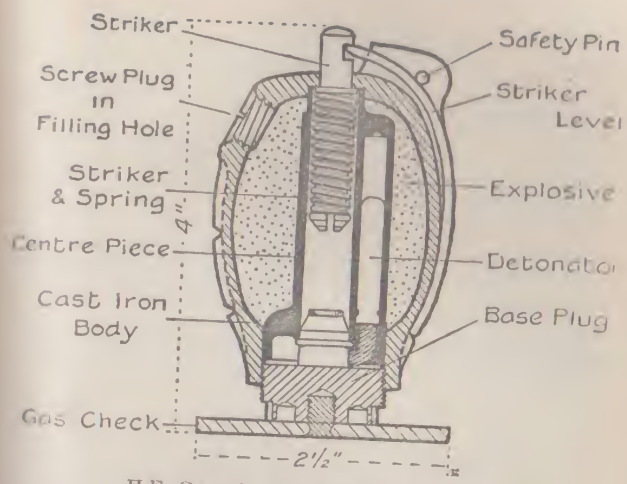
(iii) Provided that it can be done without detriment to (i) and (ii) to provide depth to the defence by fire at long range, working for the purpose grouped.

(*c*) In withdrawal this platoon will normally act as rear party or covering troops on the move and halted.

(*d*) During the gaining of contact phase its primary role will be the protection of its own unit.




Mortar (2-inch)
MUZZLE COVER
CLEANING ROD
BARREL CATCH
FIRING GRIP
TRAVERSING CLAMP
SIGHT BRACKET
BREECH END
TRAVERSING BRACKET
SLING
Barrel
Disc
Washer
BOMB, M.L., H.E.,
2-INCH MORTAR, MARK I
EYE TOO NEAR
SIGHTING BRACKET
TRAVERSING SCREW

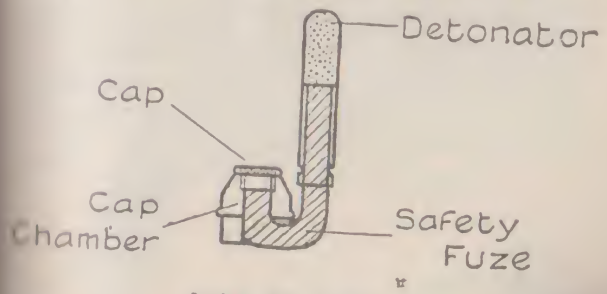


H.E. Grenade (with gas check fitted).

Hold the grenade firmly with the lever under the fingers; withdraw safety pin. So long as the lever is held, the grenade is safe.

When the grenade leaves the hand or discharger, the lever flies off, the striker is forced down on to the cap of the igniter set by the spring, and ignites the fuze which burns for 7 seconds, at the end of which time the grenade explodes.

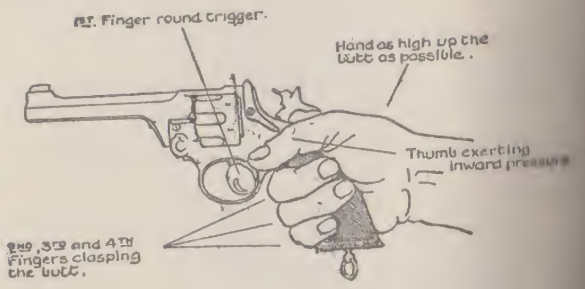
While the fuze is burning, the gases escape through the escape hole in the cap, the gas slot in the striker and the striker sleeve to the outer air.



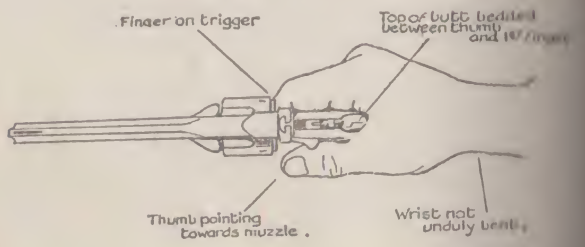
Igniter Set (section).

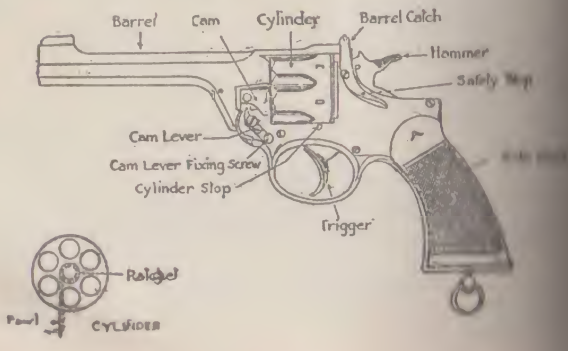
PISTOL, REVOLVER—.38"

Correct Hold (Side View).



Correct Hold (Top View).





From S.A.T. Vol. I, Pamphlet No. 21, 1940—"The Thompson Sub-Machine Gun"

Infantry Training, and Infantry Section Leading

7. General

Although infantry may sometimes fight without the help of other arms, the co-operation of the latter is usually necessary to achieve

The section commander must therefore know:—

i. The general characteristics of other arms and what assistance they can give him.

ii. What he can do to help to give this assistance.

2. The arms and weapons considered in this chapter are:—

Cavalry and armoured cars.
Artillery.
Machine guns.
Tanks.
Anti-tank guns and anti-tank mines.
Aircraft.

8. Cavalry

1. Cavalry, either horsed or mechanized, are mobile troops designed for rapid movement.

During an advance the main task of the divisional cavalry (with which infantry are chiefly concerned) is reconnaissance some miles ahead of the flank of the infantry. It can also be sent forward to secure a position until the infantry arrives. In a withdrawal, its role in addition to reconnaissance, may be to delay the enemy in order to cover the retirement of other troops.

2. Though our own cavalry can be expected to locate any large bodies of the enemy, they cannot guarantee that small bodies will not pass between them and the infantry. They are not therefore a complete guarantee of safety from surprise and infantry is always responsible for its own protection.

3. Enemy mechanized cavalry patrols will reconnoitre to collect information and infantry must be prepared to meet such patrols at any time. Infantry which keeps cool has little to fear from their action. Small arms fire should be directed at the commanders' or drivers' window slits.

9. Artillery

1. Artillery can fire high explosive or smoke shells at ranges much greater than those of infantry weapons. The bulk of the artillery support for the infantry will come from the field artillery which is normally mechanized and equipped with the 25-pr. gun-howitzer. The gun-howitzer can fire as a gun when the shell has a comparatively flat trajectory and as a howitzer when the shell has a very high trajectory like the mortar.

2. The fire of the artillery is normally controlled by an officer in a position known as the observation post (O.P.) with as good a view as possible of the enemy. The observation post is connected by wireless and line telephone to the battery.

3. The artillery tasks most closely affecting the infantry are:—

i. During the attack to shell or smoke the enemy and thus reduce the effects of his fire, so that the attacking infantry can advance successfully.

ii. In defence to protect the infantry by fire on areas which cannot be engaged satisfactorily by infantry weapons.

iii. Where the enemy defences are protected by wire, and no other means of destroying it are available, passages may be cut by artillery fire.

4. Successful artillery support depends largely on the rapid and accurate information which can be sent back by the leading troops.

10. Medium Machine Guns

1. Medium machine guns are grouped in mechanized machine-gun battalions equipped with 15-cwt. trucks.

2. The Vickers medium machine gun can fire with accuracy up to 2,000 yards, and therefore beyond the effective range of the opposing rifles and light machine guns. (See footnote.)

Being belt fed and water cooled, it is capable of sustained fire. So long as certain preparations have first been carried out by daylight, accurate fire can be ensured in darkness, smoke or mist, when the gun is fired on a "fixed line."

Owing to the great length of the beaten zone in proportion to its width (e.g., 800 yards long by 5 yards wide at 1,000 yards range) the most effective fire is obtained when fire is delivered obliquely or in enfilade.

Although direct fire is the normal and most effective method of engaging a target, medium machine guns are capable of firing *indirectly*, i.e., when the target is not visible from the gun position.

Firing on a fixed tripod mounting *overhead* fire can be employed with safety.

11. Tanks

Infantry tanks provide the most valuable form of support for infantry, especially in an attack against a prepared position. Owing to their armour being proof against small arms fire, they can precede the infantry, make gaps in the enemy wire and neutralize or destroy his automatic weapons.

[illegible] Vickers M.M.G.: Recent modifications in charge and bullet design have increased the range potential to nearly double the limit indicated above.

When used, they will usually be employed in large numbers.

2. Tanks communicate with infantry by means of flag signals, which should be familiar to all ranks. They are:—

Signal	*Meaning*
Red, white and blue.	Friendly tank coming out of action to rally.
Green and white.	Opposition neutralized. Infantry come on.
Red and yellow.	Out of action. Do not wait for me.

12. Anti-Tank Guns

Certain regiments of the artillery are equipped with anti-tank guns and are fully mechanized. The gun is a semi-automatic weapon, firing an armour piercing shell which will penetrate the armour of all known tanks at quite long ranges. The shell has a flat trajectory up to [illegible] yards. These guns will normally be used to cover likely tank approaches and will usually be sited in conjunction with anti-tank mines. They will not normally be employed to cover road blocks.

13. Anti-Tank Mines

Against A.F.V. assault anti-tank mines play the same part that barbed wire does against infantry. Anti-tank mines are usually sited to protect localities or to block tank approaches and, like all other obstacles, they must be covered by fire. The infantry will usually be called upon to put the mines in position.

14. Aircraft

1. Aircraft may be used for the following purposes:—
   i. To discover the enemy dispositions.
   ii. To direct the fire of the artillery.
   iii. To attack troops on the ground with bombs and machine guns.
   iv. To spray troops on the ground with gas.
   v. To discover and report the position of our own forward troops.

2. All troops must be able to distinguish between our own aircraft and those of the enemy.

When our own aircraft call for information, which they do by [illegible] white signal lights, forward sections must signal their positions in the manner prescribed in orders. Although communication between aircraft and ground is normally carried out by wireless or radio telephony, they occasionally wish to communicate by dropping messages. [illegible] responsible that if one of these messages drops in their vicinity it is sent as rapidly as possible to the nearest headquarters.

15. How to Help Friendly Supporting Arms

1. In order to give supporting fire when it is needed commanders of supporting weapons *must have accurate information of the positions of both the enemy and our own troops.* The enemy will naturally conceal his weapons as much as possible and the first problem is therefore to discover where they are located. Commanders mainly depend on the forward infantry for their information. Section commanders should, therefore, always try to spot the enemy machine guns and anti-tank guns and send back accurate information as to their positions. Unless this information is accurate and received quickly it will be valueless

CHAPTER TWENTY

ELEMENTARY TACTICS

Infantry Section Leading. Infantry Training.

GROUND AND FORMATIONS

1. Field Signals

1. In controlling troops by signals, a short blast of the whistle (i.e. the cautionary blast) will be blown before the signal is made, in order to attract the attention of the troops. When he is satisfied that his signal is understood, the commander will drop his hand to his side, on which the units under him will act as ordered. Signals should be made with whichever arm will show most clearly what is meant.

Flag signals used by tanks for communicating with infantry are given under "Supporting Arms".

2. **Signals with the hand.**—The following control signals are used:

i. *Deploy.*—The arm extended to the full extent over the head and waved slowly from side to side, the hand to be open and to come down as low as the hips on both sides of the body.

If it is required to deploy to a flank, the commander will point to the required flank after finishing the signal.

ii. *Advance.*—The arm swung from rear to front below the shoulder.

iii. *Halt.*—The arm raised to the full extent above the head.

iv. *Retire.*—The arm circled above the head.

v. *Change direction, right (or left).*—The arm is first extended to the with the shoulder. A circular movement is then made, on completion which the arm and body should point in the required direction.

When troops are halted the above signal means change position (or left).

vi. *Right (or left) incline or turn.*—The body or car turned to the required direction and the arm extended in line with the shoulder pointing in the required direction.

vii. *Close.*—The hand placed on top of the head, the elbow to be to the right or left according to which hand is used.

The above signal denotes *close on the centre.* If it is required to a flank, the leader will point to the required flank before dropping hand.

If, when on the march, it is required to halt as well as close, will give the halt signal before dropping his hand.

viii. *Quick time.*—The hand raised in line with the shoulder, bent and close to the side.

ix. *Double* or *increase speed* (M.T.).—The clenched hand moved up and down between the thigh and shoulder.

x. *Follow me.*—The arm swung from rear to front above the shoulder.

xi. *Start up* (M.T.).—Circular movement of the hand as if starting an engine.

xii. *Mount* (M.T.).—Two or three slight upward movements with the hand (palm uppermost).

xiii. *Lie down* or *dismount* (M.T.).—Two or three slight movements with the open hand towards the ground (palm downwards).

xiv. *As you were* or *switch off* (M.T.).—The arm extended downwards with the hand open, and waves across the body, parallel to the ground.

xv. *Slow down* or *resume normal speed* (M.T.).—The arm extended to the side level with the shoulder, palm downwards, and moved slowly up and down with the wrist loose.

xvi. *Form line* (M.T.).—The arm waved horizontally from right to left and back again as though cutting with a sword, finishing with the delivery of a point to the front.

xvii. *Form close column* (M.T.).—The hand raised perpendicularly above the head and lowered and raised several times.

xviii. *Last order completed.*—The salute, followed by the hand raised vertically above the head, hand open and fingers together.

xix. *Right* (or *left*) *take ground.*—Hand brought to the shoulder with the fist clenched, and the arm extended sharply in the required direction two or three times. Of use to get M.T. vehicles off the road, when practicable, to avoid enemy aircraft attacks.

3. Signals with the rifle.—

The following *communicating signals* are made with the rifle:—

i. *Enemy in sight in small numbers.*—The rifle held above the head to the full extent of the arm and parallel with the ground, muzzle pointing to the front.

ii. *Enemy in sight in large numbers.*—The rifle held as in the previous signal, but raised and lowered frequently.

iii. *No enemy in sight.*—The rifle held up to the full extent of the arm, muzzle uppermost.

These signals may be used by scouts, etc., sent on ahead of their sections. Care should be taken that the signal cannot be seen by the enemy.

4. Control by whistle blasts.—

The following whistle blasts are used:—

i. *The cautionary blast (a short blast).*—To draw attention to a signal order about to be given.

ii. *The rally blast (a succession of short blasts).*—To denote *close on leader* in wood, bush, fog or darkness, when the signal cannot be seen. Men will double towards the sound of the whistle, and rally on the leader facing in the same direction.

iii. *The alarm blast (a succession of alternate long and short blasts).*—To turn out troops from camp or bivouac to fall in, or to occupy previously arranged positions.

iv. *Enemy aircraft in sight (a succession of long blasts).*—Since the signal will often be inaudible, a visual signal will also be used to attract attention, viz. both arms held above the head and the hands waved. On this signal, troops either get ready to fire, open out or take cover according to the orders in force.

v. *Enemy aircraft attack ended (two long blasts repeated at intervals of five seconds).*—On receipt of this signal all troops resume previous formations. Troops which have been firing will recharge their magazines before moving off.

2. Fieldcraft

(Detailed instructions for fieldcraft training will be found in Infantry Training, 1937, Secs. 33 to 36)

1. The term fieldcraft includes **initiative, cunning** and **intelligence** in the use of ground so that a soldier may arrive on his objective fresh and fit to fight.

2. Owing to the wide extensions and the consequent lack of personal supervision by commanders, the individual must possess to a high degree the art of using ground.

3. The section commander must study ground to see how it will assist either himself or the enemy in providing:—

i. observation points,
ii. fire effect,
iii. cover from view,
iv. protection from fire,
v. obstacles to movement.

He should understand the effect on his movements of different types of country (i.e. forward and reverse slopes, woods and villages) and of the effect of weather conditions. He should study the means of keeping direction, and should know how to work in darkness, fog and [illegible]. Finally, he should realize how conditions of ground and vegetation affect the formation of his section.

4. In deciding what route to follow he must decide:—

i. The point to make for.
ii. The route to follow.
iii. The speed at which to move.

5. In order to reach his objective the section commander may [illegible] have to make for intermediate points.

6. The ideal line of advance provides adequate protection [illegible] and cover from view throughout its length, and at the same time [illegible] good fire positions or positions of observation on the way. [illegible] concealment and protection it is usually necessary to use [illegible]

but high ground normally provides better positions from which to observe or fire. It is comparatively rare to find a route in which these advantages are combined. The section commander in making his choice must remember that a section should advance as long as possible before halting to open fire. Thus it is usually best to follow the route giving the more concealed line of approach. Observation points on the way are of value for noting the progress of friendly troops co-operating in the advance as well as for observing the enemy's position.

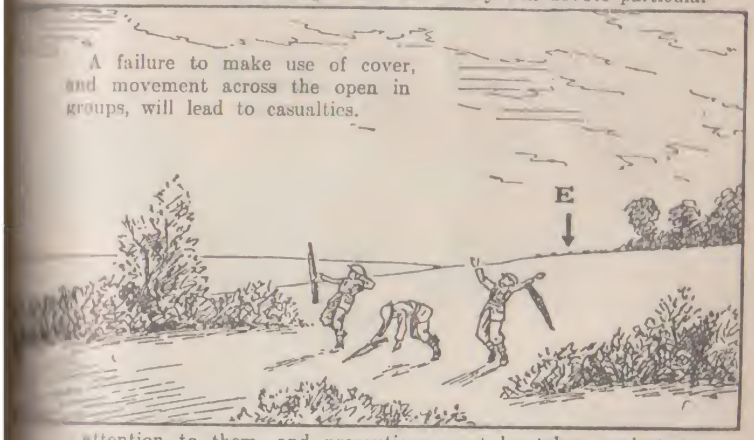
3. Cover From View

i. **Types of cover.**—Some of the chief types of cover are:—

i. *Undulating ground.*—This form is the least obvious, and considerable experience is necessary before its possibilities are fully appreciated. When skilfully used, it may give protection from fire, and it affords no ranging mark for the enemy.

ii. *Hedges and bushes.*—These afford cover from view, but not from fire. In open country they may afford a good ranging mark for the enemy's artillery and automatic weapons.

iii. *Sunken roads, the dry beds of streams and ditches.*—These give excellent cover, often from fire as well as from view. If obvious, however, there is a danger that the enemy will devote particular attention to them, and precautions must be taken against an ambush. If they are straight, the enemy may be able to fire down them in enfilade.



iv. *Standing crops.*—These afford cover from view, but often restrict the field of fire, and movement through them can generally be noticed.

ground which the firer cannot see from his position is called "dead ground." The section commander should be able to recognize what ground is likely to be dead to the enemy.

2. **How to use cover.**—To make the best use of cover for movement, the section commander must look ahead.

Crawling is seldom worth while, except for very short distances such as the last few yards to a fire position, for withdrawing from a fire position, and for concealing movement over a few yards. For longer distances it is tiring and causes delay. Success will often depend on the speed of the advance.

Before crossing a gap, section commanders should study its width and consider what targets their sections are likely to present to the enemy. If the gap is a small one that can be crossed in a few seconds the whole section should double over in one rush keeping as closed up as possible. If, however, the section is likely to be exposed to the enemy's view for a longer period, then it is best crossed by one or two men at a time at irregular intervals.

3. **Camouflage** means the employment of artificial aids to effect concealment against ground or air observation.

All ranks must first make use of natural cover, and if these do not suffice supplement them by artificial (i.e. camouflage) methods. N.C.O.s should understand the use of those artificial aids which may be available.

4. The art of personal concealment from ground and air observation should be a part of all fieldcraft training.

The following points require special attention:—

i. The value of irregularity. Avoid a straight line; regular outlines will always show up against the countryside.

ii. Shiny and light surfaces reflect light. Anything which shines will at once catch the eye of an observer.

iii. The use and mis-use of local vegetation. Heather or small bushes if used with intelligence may be of great help, but care must be taken not to employ too much. A large bush advancing across a ploughed field will hardly fail to attract attention.

The above section should be read in conjunction with "Concealment and Camouflage," this Pamphlet.

4. Keeping Direction

1. Closely bound up with skill in the use of ground is the ability to keep direction. To make a detour to obtain concealment, or to avoid an obstacle, is liable to throw leaders off the correct line of advance. Difficulties in keeping direction also arise in close or undulating country, or in darkness or fog.

For these reasons a section commander must, as soon as he is given his objective, immediately consider how he will keep correct direction.

2. The surest way of keeping direction is by the use of landmarks, a compass, or map. Section commanders do not normally carry the two latter but should be able to use both. When working within the platoon the section commander must keep in touch with the platoon commander.

moving independently, the section commander can best keep direction by the following means:—

i. If time permits, by using a rough sketch copied from the platoon commander's map.
ii. By keeping two distant prominent objects in view.
iii. By using a series of easily recognizable landmarks, each visible from the previous one.
iv. By using the sun or stars.
v. By noting the direction of the wind.
vi. By memorizing a route from the map. Points such as distance to object, direction, whether up or down hill, likely distant landmarks, cross roads, buildings and streams, etc., will prove a help.

The section commander should move by bounds with frequent pauses to check direction.

5. Section Formations

1. Section formations depend chiefly on ground and type of enemy fire likely to be encountered. (*See* foot note.)

(Plate I)
A section in file.

2. When within range of enemy small arms fire, sections must deploy [illegible] adequately protected by ground.

It is easier for section commanders to control their sections when closed, but it may be necessary to dispense with a certain amount of control in order to avoid losses. The section formation will also depend on whether it will be necessary to fire.

The formation to be adopted will, therefore, depend on:—

i. Control.
ii. Ground.
iii. Fire production.
iv. Enemy's fire.

Note.—Plates I-IV do not show full number of men per section, which is now ten.

These four points are conflicting and the section commander must strike a balance which will give his section the best advantage.

3. The main formations with their advantages and disadvantages are as follows:—

Formation	*Advantage*	*Disadvantage*
File	Close formation facilitates control and rapid movement.	Vulnerable. Not good for fire production.
Single file	Useful for certain types of cover such as hedgerows.	Not good for fire production.
Extended line	Useful for crossing open ground under fire.	Difficult to control
Arrowhead	Facilitates deployment to either flank.	Control is more difficult than when in file or single file

The following illustrations show how section formations might be altered to suit different types of country during an advance.

4. During an advance the section commander should change formation to suit the ground and the tactical situation. He should never adhere

(Plate II)

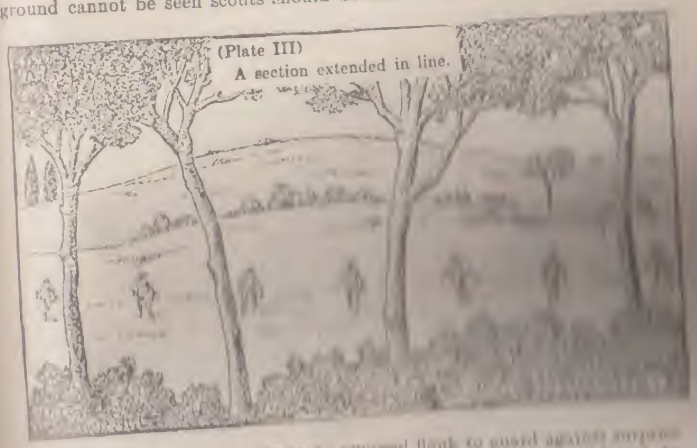
A section in single file. Note that the section commander is making use of the shadow as well as the hedge.

rigidly to a certain formation because it has been depicted in a training manual, but must be prepared to manœuvre within the section so as to make the best use of all available cover.

5. When sections are deployed, orders will be replaced by signals or brief instructions from the section commander, e.g. "Behind me in file," "on my right and left...paces," "across that bridge and line the bank," "arrowhead," etc. Such instructions should be brief and to the point. The better the training and discipline of the section, the shorter can be the orders.

6. Scouts

1. **General.**—Scouts are used for local protection to prevent the section from being surprised, for ground reconnaissance and for the collection of other information. When the platoon is deployed the section commander is responsible for his own protection. This can often be obtained by the use of suitable formations, if the enemy has been located and the ground in front is clear, but when the position of the enemy is unknown and the ground cannot be seen scouts should be sent forward. It may sometimes



(Plate III)
A section extended in line.

be necessary to employ scouts on an exposed flank to guard against surprise. The section commander must remember that the scouts should not be employed so as to mask the fire of the section, that their use makes control difficult and reduces the fire power of the section.

2. **How scouts work.**—Scouts work in pairs. They move forward by bounds from one objective to another. When the objective for the next bound has been selected, one of the pair chooses his route to it and moves forward as rapidly as possible, while the other remains in observation. When the first scout reaches his objective, he signals the other to come forward. This having been done, the process is repeated. The reasons for this procedure are:—

1. The second scout is able to cover the advance of the leading scout and is ready [illegible] withdraw if surprised by the enemy.
2. [illegible] difficulties, the other can inform the [illegible] to enable him to take the necessary action.
3. [illegible] a scout is to be noticed being seen; he should use his [illegible] of other men.

There is this difference between these two types of patrols: in the former the movements and actions of the patrol depend on the plans and movements of the force it is protecting; in the latter the action of the patrol does not depend on the unit from which it is sent out, as it has no protective responsibilities.

9. Fighting Patrols

1. By reason of their task fighting patrols must be prepared to act offensively. They will usually be commanded by an officer and will consist of two or more sections. They must be strong enough to deal with enemy patrols likely to be encountered, to capture prisoners and to bring back wounded.

2. The task of a fighting patrol may be protective or for some special purpose. Examples of the former type are patrols to delay the enemy during a withdrawal, to counter enemy patrols, to act as covering parties in defence, or to protect troops forming up for a night attack. Examples of the latter type are patrols sent out to secure identifications, to harass the enemy or to cover a demolition party.

There is no country that will stop a good infantryman. With his natural gift of invention and his strength of will he will overcome anything.

10. Standing Patrols

1. Standing patrols are sent out to watch approaches which the enemy is expected to use, for example, such places as fords, bridges and road junctions, or likely enemy assembly positions which are hidden from the main body. They may also occupy prominent points which an enemy must capture as a preliminary to an attack or may use as a good view point.

2. The difference between a standing patrol and a defensive post is that the latter must fight in its position to the last, unless otherwise ordered, whilst a standing patrol may change its position or withdraw if forced to do so by the enemy.

11. Sentries

1. The security of a post depends on the care with which sentries are posted, and on their alertness and efficiency.

2. Sentries must be posted so that they can warn the section silently, by day or night; they must remain in the post and avoid any unnecessary movement. During darkness, when double sentries are employed, they should be in touch with each other and able to communicate without movement. The position of reliefs should be so arranged that they can be wakened for their tour of duty without disturbing the rest of the section.

3. Sentries must understand the following procedure for dealing with persons approaching the post:—

i. If anyone approaches, the sentry will immediately warn the post.

ii. If the person or party aproaches close to the post, the whole section should be ready to fire and the sentry will call out "Halt" just loud enough to be heard. If the order to halt is obeyed, the section commander will order the person or commander of the party to advance and give an account of himself; the remainder of the section meanwhile covering the party with their weapons. If the order to halt is disobeyed, fire will be opened without hesitation. There is always a tendency at night to challenge and shoot too early. Sentries will **not** "challenge" until they are certain that those approaching are so close that the section cannot possibly miss them with fire. On very black nights it is usually better to rely on the bayonet, in which case the sentry will not challenge until the last possible moment.

4. All sentries must know:—

i. the direction of the enemy;
ii. the extent of the ground which they have to watch;
iii. the position of the section posts on their right and left;
iv. the names of any landmarks on their front;
v. the procedure to be followed if they see anyone approaching the post;
vi. particulars of any friendly patrols due to return through their post;
vii. the signal for defensive fire;
viii. the countersign.

PART SIX

FIELD ENGINEERING

		Page
Chapter XXI	—Protective Works for Section	181
" XXII	—Concealment and Camouflage, Wiring and Road Blocks	186

CHAPTER TWENTY-ONE

PROTECTIVE WORKS FOR SECTION

Infantry Section Leading. Manual Field Engineering, Vol. I. (All Arms). Field Service Pocket Book, Pamphlet No. 4.

1. The Section Commander's Responsibilities

1. The section commander is responsible for the following:

i. *That the section weapons are placed so that they can actually fire on the ground allotted to them.*—The platoon commander, in selecting the section position, will have taken this into consideration but the section commander must select the site for each weapon; *this must be done with the eye close to the ground.*

ii. *That the section is properly dug in.*—*See* para. 2, below.

iii. *That the section is concealed.*—*See* para. 2 below.

iv. *That a proper routine is observed* when a post is established— *See* Sec. 74 of Infantry Section Leading.

2. Considerations affecting the different types of defences with which the section commander may have to deal are discussed in the following sections:

Improvement of natural cover.... Sec. 2
Weapon pits..... Sec. 3
Crawl trench..... Sec. 4

2. Improvement of Natural Cover

1. When making use of natural cover, prominent landmarks must be avoided. Advantage should always be taken of natural banks, ditches and hedges, particularly those which give cover from the front to a section with an oblique or enfilade task.

Some of the types of cover which may be available are:—

i. Sunken roads and railway cuttings. May become shell traps. Can be improved by digging into the bank nearest the enemy to make fire positions and shelters.

be traced on the ground if circumstances permit. This is to ensure that sufficient room has been left for traverses and that the pits have been so sited so as to avoid unnecessary digging if they are to be joined up later into a complete trench system. As a rule, to minimize the effect of shells or enfilade fire, a bend in the trench or traverse is required between every ten yards of straight trench.

A little skill and you can conceal your position. (Read Chapter XXII.)

3. There should usually be at least two men in a weapon pit for companionship. Three weapon pits should suffice for a section; the section commander will probably be in the same pit as the light machine gun.

Section of a weapon pit

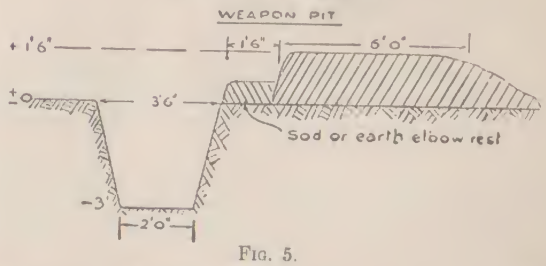


FIG. 5.

4. Each weapon pit must be sited square to the most important fire task allotted to its occupants. At the same time the necessity for all round defence must not be overlooked. *It is essential* that section commanders get down and test with the eye, at the height of the proposed parapet, whether the necessary view can be obtained.

5. The average dimensions of the pits are 3 ft. 6 ins. wide at the top and 3 ft. deep. See Fig. 5.

The parapet consists of the earth thrown up in front from the trench. The height of the parapet will depend on the amount of command necessary. The lower the parapet the less conspicuous the weapon pit will be.

A weapon pit (to accommodate 2 men) can be dug in average ground by one man in four hours.

If the parapet is made less than 1 ft. 6 ins. the weapon pit should be deepened correspondingly to provide a total firing height of 4 ft. 6 ins. In such cases the surplus earth should be used to protect the most vulnerable flank or the rear.

4. Crawl Trench

1. Crawl trench consists of a semi-circular cut in the ground, 3 ft. 6 ins. wide at the top and 1 ft. 6 ins. deep in the middle; 5 yards run can be dug in average ground by one man in four hours.

Section of a crawl trench

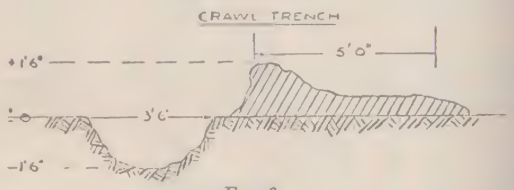


FIG. 6.

NOTE.—Some of the excavated earth (spoil) is thrown high to give cover from view (though not from bullets) for men crawling along the trench; and some is thrown far enough forward to give the same appearance as the spoil from a 3-ft. deep trench. (*See* Fig. 6.)

2. When these tasks have been completed the defensive position will consist of weapon pits connected up by crawl trench. Thus the occupants of the position will have protection from fire in the weapon pits and protection from view when moving from one pit to another. Crawl trench is merely an intermediate stage in the development of defences. It must be deepened to 3 ft. as soon as possible.

3. If the section is finding sentries, these should be relieved from digging for short spells of 30 minutes' duty.

4. If a Verey light or parachute light goes up while the section is digging everyone must keep still.

5. Digging will frequently take place at night. Although darkness screens the work from hostile air reconnaissance it makes control of the working parties more difficult. The sites for the weapon pits or trenches will have been selected and marked by day. Section commanders must lead each man personally to his task and show him exactly what he is required to do. As the work progresses, constant supervision will be required to see that men are not deviating from the original layout of their task. Section commanders must be prepared to dig themselves though they will not be allotted a normal task.

CHAPTER TWENTY-TWO

CONCEALMENT AND CAMOUFLAGE, WIRING AND ROAD BLOCKS

Field Service Pocket Book, Pamphlet No. 4, Military Training Pamphlet No. 26—"Notes on Concealment and Camouflage". (See also Manual of Field Engineering (All Arms).)

1. CONCEALMENT AND CAMOUFLAGE

1. *Enemy observation.*—Concealment must always be directed against two dangers:—

i. Air observation—visual and photographic.
ii. Ground observation.

2. *Methods.*—The chief ways of obtaining concealment are:—

i. *Screening.*—Site works so as to make use of natural features, such as folds of the ground, hedges, trees and woods.

A screen need not be solid to be effective provided it has a background.

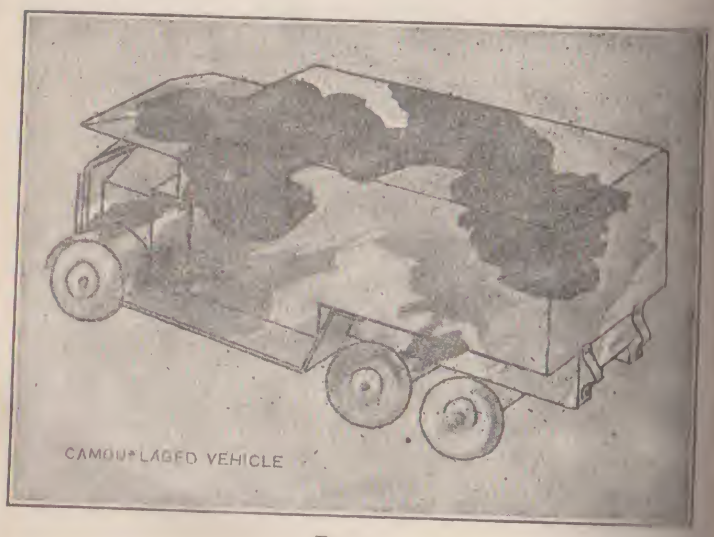


FIG. 1.

ii. *Blending.*—Avoid straight lines, unnatural colours, tone, shadows or absence of shadows or repetition of stereotyped works. Against trained air observation, it is only possible to conceal a limited number of small and important works, such as emplacements and observation posts.

iii. *Deceiving.*—Construct dummy trenches, machine gun positions, battery positions, etc. To be effective, dummies must be sited in probable positions, they must reproduce normal evidences of occupation, must appear to have been intended to be concealed, and must be complete, e.g., tracks must be maintained. Dummy trenches need only be 12 to 18 ins. deep, and branches of trees laid in them increase the shadow and appearance of depth.

3. *Concealment from air observation.*—Primarily against photography as, except for movement and differences of colour (as opposed to tone), anything which will deceive the camera will deceive an observer flying at normal heights. Figure 1 shows an example of "disruptive painting"

4. *Defensive works are usually recognisable* in air photographs by the following:—

i. Spoil heaps.—The subsoil being different in tone from surface soil shows up light in an air photograph.

ii. Development of tracks, cable trenches, etc., round and leading up to objects.

iii. Regularity.—An irregular layout should therefore be adopted, and outlines should be merged in the background by gradually thinning cover.

iv. Shadows.—Air photographs of any solid erection taken when the sun is low show long shadows which enable the height and shape of the erection to be estimated. Advantage should therefore be taken of existing shadows of trees or buildings or, if in the open, the whole shadow area should, if possible, be covered with netting.

v. *The flat top cover,* which consists of a practically opaque centre, thinning out towards the outer edges, helps to merge any shadow created into the background.

5. *Concealment of defences from ground observation.*—

i. By siting in natural cover, such as crops, banks, hedges or just inside a wood; or

ii. By siting with a short field of fire, e.g., on reverse slope, in a fold of the ground, or screened from the enemy by a hedge.

6. *The principal methods of camouflage are:*—

i. Covering over small works, dumps, etc., with semi-opaque materials which tone in with surrounding ground.

ii. Breaking up outlines.

iii. Providing dummy works, tracks, etc., to mislead the enemy.

If overhead camouflage is to be erected it is *essential* that this should be done before the soil is disturbed.

7. *Machine guns—*

The cover for a machine gun consists of:—

(i) The spider frame, complete with central telescopic support.
(ii) The 14 feet by 14 feet net.
(iii) Garnishing, consisting of coloured canvas strips.

Fig. 2 illustrates the spider equipment which affords cover from ground and aerial observations.

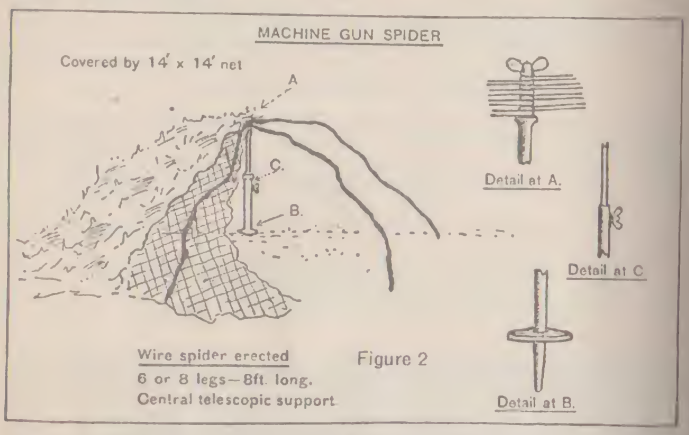


Figure 2

The garnishing of nets will be carried out by units. Detailed instructions are given in para. 9, of Sec. 19, M.T. Pamph. No. 26.

8. *3-inch mortar—*

A coloured "shrimp net" cover, 25 feet by 12 feet, is carried—to cover the mortar when not in action; and when dug in, to cover the pit from aerial observation.

9. *Some "DO'S" and "DON'T'S"—*

DO use your commonsense to outwit the enemy.
DO avoid the skyline.
DO make use of natural cover, ditches, hedges, edges of woods, folds in the ground, etc.
DO avoid conspicuous landmarks.
DO keep in the shadow, and remember that the shadow moves.
DO approach an occupied position (M.G. post, etc.) under cover.
DO avoid all straight lines or regular spacing. There is no such thing in nature.
DO remember that anything unusual catches the eye of the air or ground observer. Try to resemble your background.
DO garnish carefully by using the vegetation in the immediate neighbourhood and putting it in just as it is growing round about.

DO remember to renew dead vegetation.
DO keep turves or topsoil, when digging, to use on the parapet.
DO camouflage before daylight, if digging at night.
DO paint boldly, if you have to. Finicky patterns are useless.
DO cover lighted windows or openings at night.
DO have a sandbag behind your head when looking through a loophole.
DO take extra care when tired.
DON'T be careless and give away your comrades.
DON'T look up at an aeroplane.
DON'T expose yourself needlessly.
DON'T move unless you have to; then think first how you can move under cover.
DON'T expose a white face or hands against a dark background. Rub them with earth.
DON'T use artificial camouflage, if natural methods of concealment are available.
DON'T use vegetation unnaturally, *e.g.*, by moving a bush to the middle of a ploughed field (but you may leave it unoccupied to draw the enemy's attention).
DON'T garnish nets too thickly; thin out garnishing towards the edges.
DON'T smooth down the parapet by patting it.
DON'T walk round your camouflage point and make a track.
DON'T walk straight up to occupied positions, and make a track, or give them away to a ground observer.
DON'T take short cuts over the open; keep to the hedges.
DON'T expose lights or make a great deal of smoke.

2. WIRING

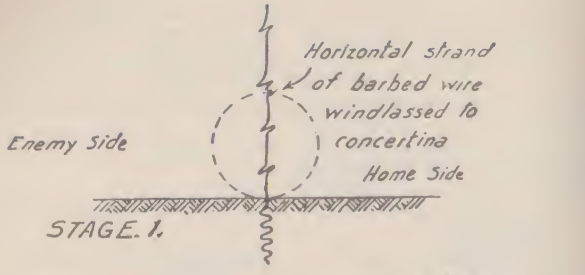
1. It is important that some form of wire obstacles should be erected in front of the defensive position as soon as possible. Platoon and section commanders must make the best use of local resources until wire can be sent up from the rear.

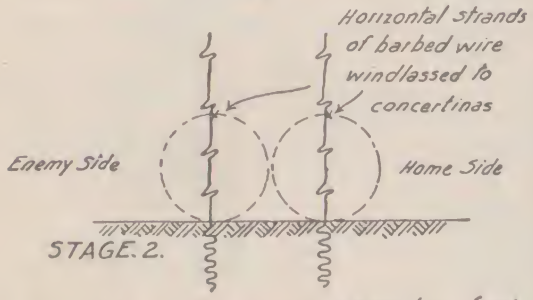
2. When this is done, more extensive wiring will be carried out under the orders of the company commander, and N.C.Os. may be placed in charge of a party ordered to construct a double apron fence or similar obstacle. They must therefore understand how to erect these obstacles both by day and night.

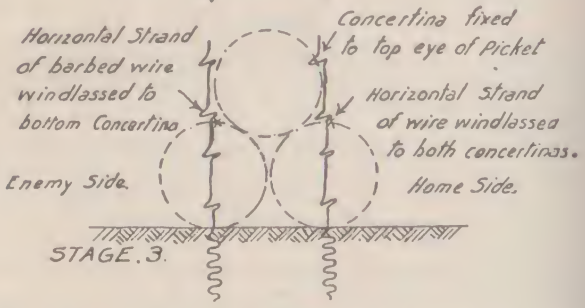
3. Drill for the erection of a double apron fence will be found in the Appendix to Infantry Section Leading.

4. *Description of the triple concertina fence.*—The "triple concertina fence" consists of:—

i. Three concertinas in the form of a pyramid.
ii. Long screw or angle iron pickets at 5 paces (4 yards) intervals through the two bottom concertinas.
iii. A longitudinal strand of ordinary barbed wire along the top of each bottom concertina. This strand to be fixed to the second eye from the top of each picket, and to be wind-lashed to the bottom concertina at intervals.







iv. The top concertina to be fixed to the top eye of the long screw pickets on the home side of the fence. The horizontal strand on the home side of the fence to be windlassed to this concertina.

NOTE.—If conditions do not allow of pickets being screwed or driven in, a fence may be made by extending the concertina and adding the pickets later.

3. ROAD BLOCKS

1. **General.**—The radius of action of A.F.Vs. raises special problems of protection which particularly affect a force on the move.

Even when no immediate threat against a flank exists, encounters with small numbers of hostile A.F.Vs. or troops in mechanical vehicles are possible. In such a situation the most economical form of protection may be to establish road blocks covering approaches on the threatened flank or flanks.

2. **Siting of road blocks.**—Road blocks should be built at points where it is difficult for crews of approaching A.F.Vs :—

i. To see the obstacle until they are close to it.

ii. To turn the vehicle round.

iii. To drive off the road and move across country.

Hence defiles where the road passes between woods, deep ditches, thick hedges or buildings are suitable. Surprise should be obtained by choosing a site round a corner, where the block will be invisible until the hostile A.F.Vs. are almost on top of it.

3. **Construction of blocks.**—Road blocks may be constructed of :—

i. *Carts.*—Farm carts filled with stone or other heavy material—farm implements wired together.

The obstacle will be improved if the trees are entangled with wire

Trees dogged together if possible

Felled tree road block

ii. *Trees.*—Big trees felled across the road. To fell a tree in a given direction, cut into it as far as the centre on the side on which it is required to fall; then strain it in that direction by means of a rope, and finish off by a cut on the opposite side, about 4 inches higher up.

To prevent A.F.Vs. from either surmounting the obstacle or brushing it aside, trees should be cut five feet from the ground, and should be left partly attached to the stump.

iii. *Anti-tank mines.*

iv. *Concertina wire* or truck tow ropes bound together by wire.

4. **Defence of the block.**—Like all obstacles road blocks must be covered with fire. One section with if possible an anti-tank rifle, is sufficient garrison for a road block.

A.F.Vs. usually work in pairs and may be supported by infantry. The anti-tank rifle or light machine gun must be sited away from the block but covering the road on the enemy's side; the remaining riflemen should be scattered in positions from which they can protect the anti-tank rifle, and engage the A.F.Vs. with fire from different angles. They must be prepared for an outflanking movement by the enemy.

Whenever possible a road block should be covered by the fire of the anti-tank rifle. This is not essential, provided adequate small arms fire is available.

5. **Alternative positions.**—Although the hostile A.F.Vs. may be expected from a certain direction, it is always possible that they may appear where least expected. Posts must be sited for all-round defence.

Where no natural cover from fire exists, garrisons of road blocks should dig weapon pits for their own protection. Clearance of field of fire will often be necessary.

Arrangements for covering the road block by fire should be such that fire can be opened in the event of hostile A.F.Vs. using smoke to conceal their movements.

PART SEVEN

MILITARY LAW AND INTERIOR ECONOMY

		Page
Chapter XXIII	Military Law and Discipline	193
" XXIV	Interior Economy	200

CHAPTER TWENTY-THREE

MILITARY LAW AND DISCIPLINE

1. Military Law; Its Nature and Purpose

Manual of Military Law

1. The object of the Manual of Military Law is to assist officers of the Army in acquiring information in respect of those branches of law with which they may have occasion to deal in the execution of their duties.

2. By the law a man who joins the Army, whether as an officer or as a soldier, does not cease to be a citizen. With a few exceptions, his position under the ordinary law of the land remains unaffected. If he commits an offence against the criminal law, he can be tried and punished for it as if he were a civilian. Similarly, in respect of civil rights, duties, and liabilities, although a few privileges are granted to him, and a few restrictions imposed upon him, for the purpose of enabling him the better to fulfil his army engagement, the ordinary law in general applies to him.

3. Whilst, however, remaining subject (with these qualifications) to the ordinary law, he has become subject also to an entirely distinct code known as "military law," which governs the members of the Army and regulates the conduct of officers and soldiers as such at all times and at all places, in peace and in war, at home and abroad. Military law is contained in the Army Act, the Acts relating to the Reserve and Auxiliary Forces, and certain other Acts applied to the Army, supplemented by the Rules of Procedure, by the King's Regulations for the Army and the Army Reserve, and in Canada by "The King's Regulations and Orders for the Canadian Militia".

The Army Act is an Act of Parliament dealing with discipline, courts-martial, enlistment, and other cognate subjects, and has in itself no permanent operation, for it continues in force so long only as Parliament from time to time decides. It is part of the "statute law"; and, with the considerable difference that so much of it as relates to discipline is administered by army tribunals and not by civil judges, it is construed in the same manner and carried into effect under the same conditions as to evidence and otherwise, as the ordinary criminal law

8241—13

The object of this special code of law is twofold:— (i) to provide for the maintenance of discipline among the troops and other persons forming part of, or following, the forces; for which purpose acts and omissions which in civil life may be mere breaches of contract—e.g., desertion or disobedience to orders—must, if committed by soldiers, even in time of peace, be made punishable offences, whilst in war every act or omission which impairs a man's fighting efficiency must be dealt with severely; and (ii) to provide for administrative matters, such as terms of service, enlistment, discharge and billeting. The term "military law" may, therefore, be used properly as including provisions of both the above classes, but in practice it is more often used with reference to the disciplinary provisions alone.

2. Discipline(*)

NOTE.—Certain of the following provisions concerning the performance of duties when under arrest, and those relating to field punishment and forfeiture of ordinary pay, are applicable only on active service. When, therefore, troops not on active service are engaged on manœuvres or exercises, these particular provisions should be referred to for instructional purposes only, but must not be put into practical use.

3. Arrest

K.R. (Can.) (See also "Note" after Section 6 below.)

1. Under Sec. 45 of the Army Act any person subject to military law when charged with an offence punishable under the Army Act may be taken into military custody, which means that the offender is placed under arrest.

2. Arrest is either close arrest or open arrest. When arrest is not described by the authority ordering it as open arrest it means close arrest.

3. Close arrest in the case of a private soldier means being placed in confinement under charge of a guard, piquet, patrol, sentry or provost-marshal. On being placed in close arrest he will be searched and deprived of knives or other weapons. If drunk he may, except in cold weather, be deprived of his bedding and boots.

4. A private soldier charged with a serious offence will be placed under arrest. He will not be placed under close arrest unless confinement is necessary to ensure his safe custody or for the maintenance of discipline. (A private soldier who disobeys an order distinctly given, or resists the authority of an officer, warrant officer or N.C.O., will be placed under close arrest forthwith). If the offence alleged is not of a serious nature, the offender should not normally be placed under arrest, but should be informed of the charge and ordered to attend at the orderly room at a specified time.

5. A private soldier in open arrest will not quit barracks except on duty

NOTES—(*) The caption "Discipline" as here used, is not discussed in the usually understood sense of a desirable military quality, but only in its military-legal usage as a group heading for a number of routine measures laid down for the *enforcement* of discipline under certain fixed circumstances.

6. A private soldier under close arrest may be ordered to bear arms, attend parades and perform all such duties as may be required of him. A private soldier under open arrest will attend parades and may be ordered to perform all duties.

7. Care will be taken to ensure that a soldier under arrest is called upon to perform no duties in addition to those performed by soldiers not under arrest or undergoing punishment.

4. Powers of a Commanding Officer

1. A commanding officer may, *subject to the soldier's right to elect, previous to the award, to be tried by district court-martial,* inflict the following summary punishments:—

ON A PRIVATE SOLDIER

(i) Detention not exceeding 28 days, but the power of awarding detention exceeding 7 days, except in cases of absence without leave, will not be exercised by a C.O. under the rank of field officer, except when specially authorized.

(ii) Field punishment not exceeding 28 days.

(iii) Forfeiture of all ordinary pay under Sec. 46 (2) (*d*) of the Army Act for a period commencing on the date of award and not exceeding 28 days.

(iv) In the case of drunkenness a fine not exceeding $16.00.

(v) Any deduction from ordinary pay allowed under Sec. 138 (4) and (6) of the Army Act, except that in the case of a soldier who, by neglect or culpable mismanagement, loses or damages any articles of his personal equipment or any other Government property, the approval of the D.O.C. must be obtained if the amount proposed to be recovered from any soldier exceeds $20.00.

A commanding officer may also inflict the following minor punishments, the offender having no right to elect trial by a court-martial:—

PRIVATE SOLDIER

(vi) Confinement to barracks not exceeding 14 days.

(vii) Extra guards or piquets as punishment for minor offences or irregularities when on or parading for these duties.

(viii) Admonition.

5. Powers of a Company Commander

1. A company, etc., commander may award a private soldier punishment not exceeding seven (7) days' C.B. for minor offences, extra guards and piquets, fines for drunkenness, and he may deal with cases of absence without leave, where pay is automatically forfeited, and may award any punishment within his ordinary powers for such absence.

8241—13½

6. Powers of Detachment Commander

1. A detachment commander may award summary punishment as under:—

(*a*) If of field rank.—The full powers accorded to a C.O. of a unit.

(*b*) If not of field rank.—The power of awarding detention is limited to 7 days, except when specially authorized.

General Note:—Up to this point the clauses under the heading "Discipline" have been selected from an abridged version of the subject as printed in Pamphlet No. 11 of the "Field Service Pocket Book, 1939"; excepting that currency, etc., has been altered to the Canadian equivalent laid down in K.R. (Can.).

The quoted Pamphlet No. 11 includes some further abridged passages under the same heading.

7. Redress of Grievances

K.R. (Can.)

417 (*a*) The manner in which an officer or soldier should proceed to obtain redress for any grievance under which he conceives himself to be suffering is prescribed in Sections 42 and 43 of the Army Act and the notes thereto in the Manual of Military Law. An officer or soldier may also make any complaint to an inspecting officer.

(*b*) The above methods of complaint alone will be recognized, and an officer or soldier is forbidden to use any other method of obtaining redress for a grievance, real or supposed. When complaints are advanced by a soldier they will be fully and distinctly stated, and such explanations will be annexed as may be necessary, with a view to their being duly investigated and adjusted as soon as practicable.

(*c*) Anonymous complaints, and the publication through the medium of the press of anything calculated to act injuriously in the interest of the service, or to excite discontent in the Militia, are strictly prohibited.

418. An officer commanding a company, etc., will, before an inspection by an inspecting officer, ascertain whether any officer or soldier desires to bring any grievance to the notice of such inspecting officer. All grievances will be investigated and settled, if possible, by the commanding officer.

419. Everything in the nature of combination to obtain redress of grievances is strictly forbidden among individuals composing a military force. Each individual must speak for himself alone. Appeals for redress by "round robins" or by means of any document bearing the signature of more than one complainant are strictly forbidden.

8. Attempts to Seduce from Duty

420. (*c*) "Under the existing law, any person who shall maliciously and advisedly endeavour to seduce any person or persons serving in His Majesty's forces by sea, land or air from his or their duty and allegiance

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to His Majesty, or to incite or stir up any person or persons to commit any act of mutiny, or to make or endeavour to make any mutinous assembly, or to commit any traitorous or mutinous practice whatsoever, may, on being convicted of such offence, be sentenced to imprisonment for life."

9. Wrong Channel of Personal Communication

423. (*a*) An officer or soldier is forbidden to write private letters to officials at National Defence Headquarters, on official personal matters.

(*b*) Attempts to obtain favourable consideration of any application by the use of outside influence are forbidden, and, if resorted to, will be regarded as an admission on the part of the applicant that the case is not good on its merits, and it will be dealt with accordingly.

10. Illegal Communication of Military Information

432. An officer or soldier is forbidden to communicate any military information which might directly or indirectly assist an enemy, to any person other than a person to whom he is authorized to communicate it, or a person to whom it is, in the interest of the State, his duty to communicate such information.

433. An officer or soldier is forbidden to publish or communicate, either directly or indirectly, to the press, any military information, or his views on any military subject, without special authority from National Defence Headquarters. Any information of a professional nature which he may acquire while travelling or employed on duty is to be regarded as the property of the Department of National Defence and is not to be published in any form without previously obtaining the permission of National Defence Headquarters. An officer or soldier will be held responsible for all statements contained in communications to other persons which may subsequently be published in the press. He is not to prejudge questions which are under the consideration of superior authority by the publication, anonymously or otherwise, of his opinions, and he is not to take part, in public, in a discussion relating to orders, regulations, or instructions, issued by his superiors.

11. The Rights of a Soldier when in Arrest Charged with an Offence under the Army Act

(*Abridged (including para. numbers) from Official Pamphlet of that title*)

INFORMATION

1. He is entitled to be informed by the Guard Commander of the name and rank of the person who ordered his arrest, and to a copy of the Charge Report (an account of his offence) as soon as the Guard Commander receives it.

Army Act, Sec. 21. K.R. (Case) 1929, para. 448 (1).

PERFORMANCE OF DUTY

K.R. (Can.) 1939, para. 452 (b).

2. If under close arrest in the guard detention room, he is not required (except on active service) to perform any duty other than as may be necessary to keep clean his quarters, person and belongings, or to enable him to hand over any cash, equipment, stores, etc., on his charge.

INVESTIGATION BY COMMANDING OFFICER

K.R. (Can.) 1939, para. 454

3. He will be brought before the investigating officer (commanding officer or company, etc., commander) without delay, and daily except on Sunday, Good Friday and Christmas Day, until his investigation is completed.

Rule of Procedure, 3 (A). K.R. (Can.) 1939, para. 454 (b).

4. He has the right to be present while his case is being heard, and has the right—

to cross-examine witnesses,
to call witnesses himself,
to give evidence on oath,
to make a statement.

Army Act, 46 (6). Rule of Procedure, 3 (B).

5. He has the right to demand that evidence against him be taken on oath.

6. In the following cases the investigating officer must ask the soldier if he wishes to be dealt with summarily or prefers to be tried by court-martial:—

(*a*) Where the officer's finding or award would involve a forfeiture of the soldier's ordinary pay;

Army Act, 46 (8).

(*b*) in every other case except where the officer proposes to award no punishment or only a minor punishment (that is to say, confinement to barracks for not more than 14 days, extra guards or piquets, or admonition).

TAKING OF SUMMARY OF EVIDENCE

Rule of Procedure, 4 (C).

7. The soldier has the right to be present while the summary of evidence is being taken down in writing.

Rule of Procedure, 4 (D).

8. He has the right to cross-examine witnesses and to have his questions and the answers included in the written summary.

Rule of Procedure, 4 (E).

9. He has the right to make a statement or give evidence or to do neither if he so wishes. He cannot be cross-examined.

Rule of Procedure, 4 (G).

10. If the officer taking the summary proposes to include in it any written statement of a person not actually present at the taking of the summary, the soldier may demand that the person attend, if he or she is one who can be compelled to attend, for cross-examination.

PREPARATION FOR TRIAL BY COURT-MARTIAL

Rule of Procedure, 14 (A).

15. He is entitled to proper opportunity to prepare his defence and to have free communication with his witnesses and with any friend, defending officer or legal adviser with whom he may wish to consult.

16. As soon as practicable (not less than 24 hours before trial) he will be given a free copy of the summary of evidence and an officer must explain to him his rights as to preparing his defence and as to being assisted or represented at his trial and must ask him to state in writing whether he wants a defending officer to represent him at the trial. Rule of Procedure 14 (B).

17. Not less than 24 hours before his trial the soldier must be given a copy of the charge sheet containing the charges against him, and if necessary may have it read and explained to him by an officer. Rule of Procedure 15 (B).

18. He may give the names of any witnesses whom he wants the military authorities to call in his defence; and he has the right to have such witnesses called for him if they can reasonably be procured. In the case of an unreasonable or frivolous demand he may be required to pay the expense. Rule of Procedure 78.

19. He has the right to demand a list of the ranks, names and regiments of the president and other officers who are to form the court or to be officers in waiting at the trial. Rule of Procedure 15 (C).

REPRESENTATION IN DEFENCE AT A COURT-MARTIAL

20. A soldier remanded for trial has the right— Rule of Procedure 87.

(i) to be represented by a lawyer if he so wishes and is prepared to pay for the services of one; or

(ii) to be represented by an officer subject to military law if a suitable one is available; or

(iii) to be assisted by any person whose services he may be able to obtain.

21. If the prosecution is going to be conducted by a person with legal qualifications, the soldier has right to sufficient notice (at least seven days) to give him time to obtain a lawyer to conduct his defence if he so wishes. Rule of Procedure 89.

The remainder of the quoted Pamphlet deals in detail with the following headings of procedure:—

Para. 11–14—Identification Parades.
" 22 —Opinion of Judge Advocate.
" 23 —Application for Postponement of Trial.
" 24 —Joint Trial.
" 25 —Separate Charges.
" 26–27—Objections.
" 28–29—Special Pleas.
" 30 —Presence in Court.
" 31 —Questioning Witnesses.
" 32 —Evidence in Defence.
" 33 —Petition.

CHAPTER TWENTY-FOUR

INTERIOR ECONOMY

HYGIENE AND SANITATION

Army Manual of Hygiene and Sanitation

1. Introduction

The maintenance and promotion of the health of the troops and the prevention of disease are not the concern of the Medical Services alone, but are the duty of every officer, non-commissioned officer and man in the Army and can only be carried out if every one is conversant with the laws of health, the scientific reasons for these laws, and the methods by which they can be put into practice.

Ignorance of the laws of hygiene is the cause of most of the outbreaks of diseases, but sanitary discipline is also of the greatest importance. Breaking the laws of hygiene brings retribution as certainly and quickly as breaking the laws of the State.

The majority of the diseases which affect armies are preventable, and a study of past campaigns shows that many more men are disabled by sickness than by enemy action. In the Peninsular War three times as many men were lost from sickness as from wounds, and more than twice the strength of the Army were admitted to hospital on account of disease.

In the Crimean War, 1854-56, in the British Army 89 men per 1,000 died of disease and only 17 per 1,000 were killed in action or died of wounds, while the French Army lost 114 per 1,000 from disease compared with 30 per 1,000 killed or died of wounds.

Instances have occurred where armies have been decimated by disease before reaching the scene of operations and also where expeditions have had to be abandoned owing to the ravages of diseases in camps.

A comparison of the last two great campaigns fought by the British Army gives a striking example of the reduction of disease by improved sanitation and preventive measures. In the South African War, 1899-1902, with a British force of 208,000 men, there were 57,684 cases of typhoid fever, of which 8,022 were fatal, whereas in the Great War of 1914-1918, with approximately six millions British, Dominion and Indian troops engaged in numerous theatres of war, there was a total of 31,011 cases of typhoid, of which only 777 were fatal. This remarkable reduction was undoubtedly due to the increased attention paid to sanitation, inoculation of personnel and purification of water supplies. The Great War, however, was fought on many fronts and while in France and Flanders the proportion of admissions to hospital was 1·3 sick to one wounded, in Macedonia it was 27·1 and in East Africa it reached 33·1, as a result of malaria in Macedonia and intestinal diseases in Africa.

2. The Objective of Sanitation

The aim of sanitation in the Army is military efficiency and therefore everything that will maintain or improve the health of the soldier and thereby aid his military efficiency must be regarded as coming within the scope of hygiene and sanitation.

The Medical Services help by instruction, advice, supervision and precept, but these are of little avail if the rest of the Army do not play their part. It is the duty, therefore, of every one to take his share in looking after, not only his own health, but also that of his comrades. The objective is twofold, first, to prevent actual disease, and, secondly, to promote and increase the health; these are by no means the same, for men may not actually be ill but may be in such a poor physical and mental state that when any extra strain is put upon them they break down. They may be compared with a second-rate football or cricket team which just succeeds in drawing games but never wins.

3. Personal Hygiene

The daily round of life causes many impurities to be deposited on the surface of the body and these impurities must be removed if the body is to be kept healthy. The skin requires frequent cleansing not only to remove visible dirt, but also the salt, grease and dried sweat poured out from the glands of the skin, which otherwise will become clogged. Daily washing should be practised and special attention given to the armpits, crotch, between the buttocks, and the feet, especially between the toes. A hot bath should be taken at least once a week.

Cleanliness of the hands and finger nails is most necessary especially in persons handling food. The hands should always be washed after visits to the latrine and before meals.

The hair should be kept short all over the head and should be combed and brushed daily and washed frequently. Hair brushes and combs are often neglected and should be cleaned at least once a month. The teeth should be cleaned with a small soft brush twice a day or at least every evening after the last meal and should be inspected regularly for signs of decay.

WHICH ARE YOU?

Badly trained troops are careless and slovenly in billets

Good soldiers keep themselves, their clothes and their weapons in good order

GAMES AND SPORTS

"Games and Sports in the Army" and as para. 2 below

4. Policy

1. The activities under this heading, rightly considered as an indispensable adjunct to the purely military training of the forces, have, in the British Army, been brought to the very highest degree of capable and enthusiastic organization in the last twenty or thirty years. Under the tutelage of a body known as The Army Sport Control Board, with the Adjutant-General to the Forces as President, the stage was reached as early as 1933 when "nearly every garrison unit" had its rented or freehold playing-field, on which the games and athletic contests carried out are as keenly contested as in any sports aggregation in the Empire. The following excerpts from the "principles" governing the Army Sport Control Board are worth recording:—

(*a*) The provision of recreation so that all are given equal opportunity of taking part in some form of sport, in accordance with the strictest amateur principles.

(*b*) Games should be varied as much as possible, in order that they may appeal to men of every type of physique and temperament.

(*c*) Players should never be driven to sport. Games should be played in a voluntary spirit and not as a parade.

(*d*) No one should be struck off duty in order to train for competitions.

(*e*) Money prizes will not be given. They kill good sport, and encourage selfishness. Trophies, medals, etc., may be given.

(*f*) It should be the aim of every leader and man to take a personal and active interest both in playing and organizing the games of the Army, and to encourage the true spirit of sportsmanship in every way.

2. The following interesting schedules of athletic standards are from the pamphlet "Physical Training", already quoted under that head, but have been included under "Games" owing to their sports background as track events. With some simple "mock-up" equipment from local wood-sheds, and a stone for a shot, militiamen can discover for themselves what aggregate rating their present physical development would merit—and then set out to improve it.

5. Physical Efficiency Test

The test would take the form of the following athletic events, having a qualifying standard of performance as indicated:—

One mile	6·5 minutes.
100 yards	13 seconds.
High jump	3 ft. 8 in.
Long jump	13 ft.
Heaving the shot (16 lb.)	20 ft.

The idea is further developed in tabular form as shown

Physical athletic efficiency tests for recruits of all arms—scale of marking.—

No.	1	2	3	4	5	6	7
Marks	100 yds.	High Jump	Running Long Jump	Putting or Heaving Shot	1 mile	2 miles	3 miles
	sec.	ft. in.	ft. in.	ft.	min. sec.	min. sec.	min. sec.
10	11¼	5 0	18 0	32	5 0	10 30	16 30
9	11½	4 9	17 0	29	5 15	10 45	17 0
8	12¾	4 6	16 0	26	5 30	11 0	18 0
7	12¾	4 4	15 0	24	5 45	11 40	19 0
6	13	4 2	14 0	22	6 0	12 30	21 0
5	13¾	4 0	13 6	20	6 15	13 30	23 0
4	14	3 10	13 0	18	6 30	15 0	26 0
3	14¾	3 8	12 0	16	6 50	16 50	29 0
2	15½	3 6	11 0	14	7 20	18 30	32 0
1	16	3 4	10 0	12	8 0	20 0	35 0

CLASSIFICATION will be found by multiplying by 2 the aggregate of the 5 tests completed.

Recruits on joining..... Tests 1 to 5..... Special, 84 per cent.
" intermediate..... " 1 to 4 and 6..... 1st Class, 74 per cent.
" final..... " 1 to 4 and 7 2nd Class, 60 per cent.
Standard, 50 per cent.

PAY OF WARRANT OFFICERS, NON-COMMISSIONED OFFICERS AND MEN OF THE NON-PERMANENT ACTIVE MILITIA

Pay and Allowance Regulations, 1937

6. Daily Rates

The daily rates of regimental pay of warrant officers, non-commisioned officers and men of the Non-Permanent Active Militia, for periods of authorized training or service, shall be as laid down in the following table, but in the case of warrant officers and non-commissioned officers the pay of the respective ranks shall only be issued provided they have the necessary qualifications as prescribed in article 160:—

WARRANT OFFICERS, CLASS I

Regimental sergeant-major	$ 3.70
All other warrant officers, Class I	3.40

WARRANT OFFICERS, CLASS II, N.C.O'S AND MEN

Regimental quartermaster-sergeant Staff quartermaster-sergeant Quartermaster-sergeant (*)Squadron, battery or company sergeant-major	$ 2.80
Squadron, battery or company sergeant-major, other than above	$2.50
Squadron, battery or company quartermaster-sergeant	$2.20
Staff sergeant Sergeant	1.90
Lance-sergeant, corporal or bombardier	1.60
Lance-corporal or lance bombardier	1.40
Private	1.20
Boy	0.60

A warrant officer, non-commissioned officer or man performing the duties of a higher rank or appointment may be granted the acting rank and the rate of pay and allowances for such rank or appointment in the following circumstances only:

(*a*) Provided he is covering off a vacancy in an authorized establishment.
(*b*) When there is adequate reason for filling the vacancy; and
(*c*) When the candidate is qualified for the rank in question.
(*d*) Whilst holding the acting rank of Corporal granted to men attending a course of instruction under K.R. Can. 721.

W.Os., N.C.Os. and men holding acting rank will revert to their permanent rank on ceasing to perform the duties for which such acting rank was granted. Particulars will be published in Part II Orders of unit concerned.

(*) Includes only squadron, battery or company sergeants-major of Cavalry squadrons, Artillery batteries and of Engineer, Signal, Infantry or Army Service Corps companies.

Tradesmen's pay at the rates shown in the following table may be paid in addition to regimental pay to warrant officers Class II, non-commissioned officers and men performing the duties of clerks (including orderly room and pay sergeants), bakers, butchers, cooks, military police, bandsmen, farriers, dispensers, machinists and saddlers, up to the numbers provided for in establishments and subject to the conditions and limitations laid down in these regulations and such additional instructions as may be published from time to time in Militia Orders:

Sergeant and above	$ 0.35
Lance-sergeant, corporal or bombardier	0.30
Lance-corporal, lance-bombardier or private	0.25

7. Conditions Regarding Pay of Warrant and Non-Commissioned Officers

(Article 160)

A warrant officer or non-commissioned officer, with the exception of one classified in the establishment as a Tradesman or Clerk, shall not be allowed to draw the pay of his rank unless his commanding officer certifies on M.F.D. 872 in the case of—

(i) *A Warrant Officer Class I*—

That he has been duly appointed and that such appointment has been published in Militia Orders, or that he is serving the probationary period as laid down in K.R. Can. 316.

(ii) *A Warrant Officer, Class II, or a Non-Commissioned Officer*—

That he has been duly appointed and is fully qualified in accordance with the provisions of K.R. Canada.

(iii) *A Warrant or Non-Commissioned Officer who is not qualified under either (i) or (ii) above*—

That he was confirmed in his rank on or before 30th April, 1935, and received the pay of such rank under the regulations in force prior to 1st May, 1935.

N*95.—See K.R. (Can.)—Paras. 316, 320, 321, 324, 326 and 330.

NOTE.—Further details of additional pay for Field Allowance when employed at Camps of Instruction, Artillery specialists, Flying Pay, Advance Party subsistence, Marching or Baggage Allowance, Signalling Bonus, Small Arms prizes and Rifle Range Markers will be found in Pay and Allowance Regulations, 1937.